

AMERICAN GAS ASSOCIATION MONTHLY

JANUARY • 1938

Gas Industry Sales During 1937

What Makes a Gas Range Modern?

W. J. MILLER

The Cold Period Heating Plan

H. J. GIBBS

Gas Ovens Developed at Potteries



Commercial Kitchen Manual

223 pages

99 photographs and drawings

**NEW
EDITION**

Volume 3

**GAS
APPLIANCE
SERVICE
SERIES**

TABLE OF CONTENTS

- PART I.** Types and Sizes of Appliances.
Descriptions and pictures of 39 classes of gas commercial kitchen equipment.
- PART II.** Installation of Gas Appliances.
Location, venting, gas piping, adjustments, etc.
- PART III.** Servicing Gas Appliances.
Inspection, proper use, pressure regulators, burner adjustments, gas cocks, heat controls, etc.
- PART IV.** Specific Servicing Instructions for Common Types of Commercial Kitchen Appliances.
Directory of 86 manufacturers, with addresses and types of appliances made.
Servicing instructions for equipment of 63 manufacturers.
Burner ratings in B.t.u. per hour for hundreds of models.

Price \$1.00 per copy

This manual is indispensable to anyone selling or servicing commercial kitchen appliances. Send your order now.

AMERICAN GAS ASSOCIATION

420 Lexington Ave. • New York, N. Y.

AMERICAN GAS ASSOCIATION MONTHLY

Contents for January 1938

VOL. 20 No. 1

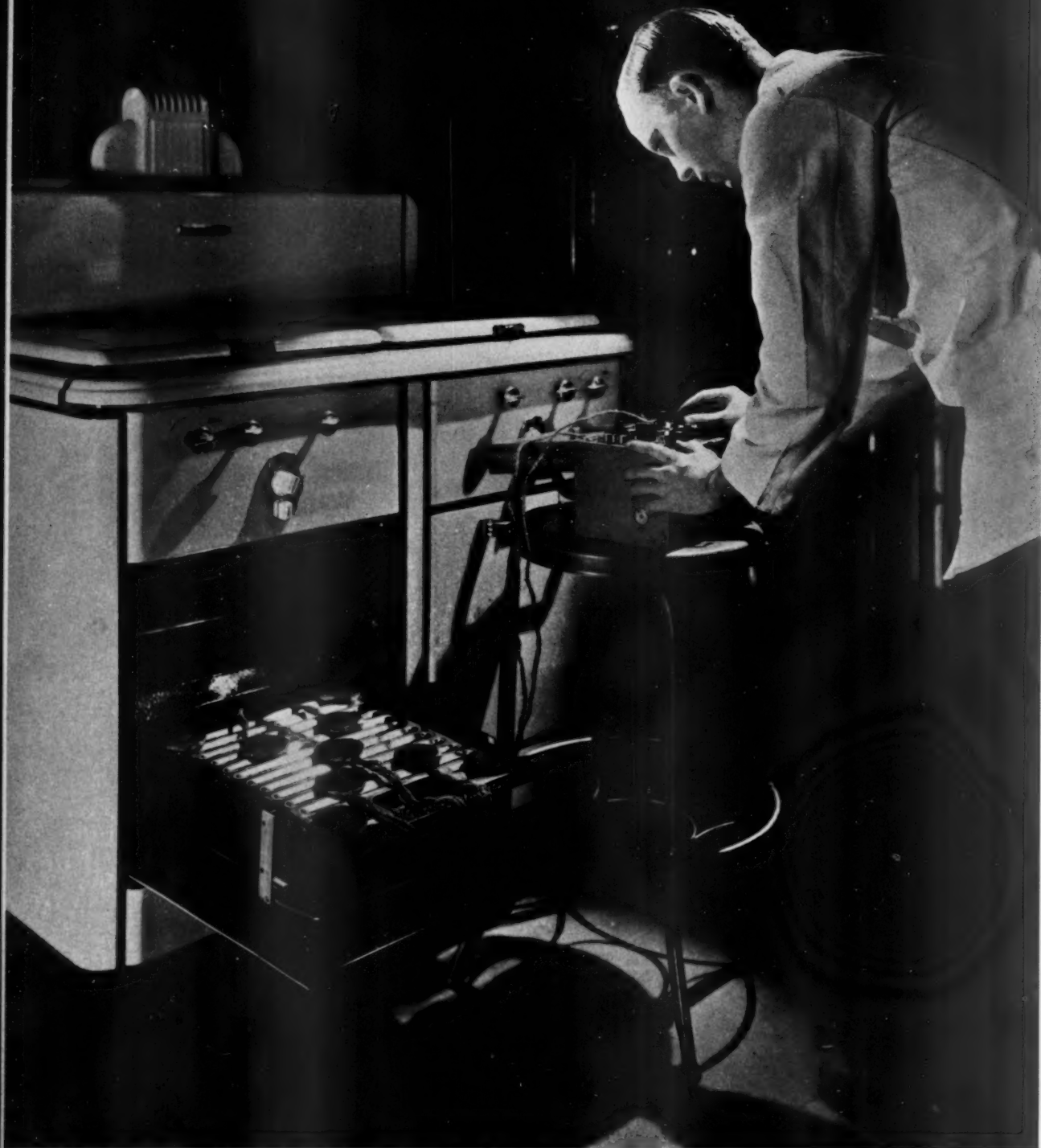
The Gas Industry in 1937.....	3	Budgeting Bills for House Heating Service....	27
What Makes a Gas Range Modern?.....	5	S. S. ELLIS	
W. R. TELLER		"Prize Parade" Gas Water Heater Sales Con-	
"House Livable" Wins Prize in Home Name		test Opens January 1, 1938.....	29
Contest	8	Home Service Gets Under Way.....	31
The Action of Frost on Buried Pipe.....	9	Advanced Applications of Gas to Forging Fine	
J. E. MACONACHIE		Steels	32
New Gas Decorating Kiln Developed at		ADAM M. STEEVER	
Lenox Potteries.....	11	Gas Takes Lead at Restaurant Convention.....	33
From Platinum Blondes to Gas Kitchens.....	14	1938 Industrial Gas Section Committees Ap-	
DEKE HOULGATE		pointed	34
The Trial Period Heating Plan—Direct and		Third Volume of Gas Appliance Service Se-	
Indirect Results.....	16	ries Completed.....	35
H. S. GREEN		Technical Section Plans for 1938.....	36
The Mystery Chef's Mailbag.....	18	J. V. POSTLES	
Gas Central Heating Installations Gain.....	21	Important Changes in Requirements Adopted	
Personal and Otherwise.....	23	by Committees.....	38
Convention Calendar.....	26	Plan Book Shows How to Use A. G. A. Seal....	39
		Personnel Service.....	40

Published eleven times a year by the American Gas Association, Inc. Publication Office, American Building, Brattleboro, Vt. Publication is monthly except July and August which will be a bi-monthly issue. Editorial Offices, 420 Lexington Avenue, New York, N. Y. Address all communications to American Building, Brattleboro, Vermont, or to 420 Lexington Ave., New York, N. Y. All manuscript copy for publication should be sent to the editorial offices in New York. The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein. Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, February 10th, 1922, under the Act of March 3, 1879.

Cable Addresses: American Gas Association, AMERIGAS, NEW YORK; American Gas Association Testing Laboratories, AMERGASLAB, CLEVELAND.

SUBSCRIPTION RATE : \$3.00 A YEAR





Conducting a broiler temperature test on a domestic gas range at the A. G. A. Testing Laboratories, Cleveland

AMERICAN GAS ASSOCIATION MONTHLY

James M. Beall, Editor

The Gas Industry in 1937

THE year 1937 was one of continued progress and expansion for the gas companies in the United States.

Manufactured and natural gas companies, supplying towns and cities with a population of 80,000,000, served a total of 17,022,000 customers, representing the largest number of consumers ever connected to the mains of the industry and an increase of 517,000 over the year 1936. Of these, 9,976,000 were served by the manufactured gas industry and the remaining 7,046,000 were served by the natural gas industry.

Revenues of the entire industry, both manufactured and natural, aggregated \$801,931,000, a gain of 4.1 per cent over the preceding year of 1936. The natural gas companies grossed \$441,176,000, a gain of 6.9% for the year, while revenues of the manufactured gas companies were \$360,755,000, as compared with \$357,531,000 in 1936, an increase of 0.9 per cent.

Sales of manufactured gas for domestic uses, other than house heating, such as cooking, refrigeration, water heating, amounted to 195,077,000,000 cubic feet, a decline of 1.6 per cent for the year. House heating sales, however, registered a gain of 9.0 per cent. On the other hand, the sales of natural gas for domestic uses registered a pronounced upturn, rising from 343,473,000,000 cubic feet in 1936 to 362,021,000,000 cubic feet in 1937, a gain of 5.4 per cent. Sales of both manufactured and natural gas for industrial and commercial purposes in 1937 averaged about 10 per cent above the previous year.

Preliminary estimates indicate that the total production of natural gas in 1937, including amounts used in the manufacture of carbon black and for field purposes, reached an all-time high of more than two and one-half trillion cubic feet, or more than 17 per cent above the previous peak established in 1936. Approximately 170 billion cubic feet of natural gas were used as fuel for generating electric power in 1937. This was an increase of nearly 9 per cent over the previous year.

During 1936 alone 1,464,000 gas ranges were sold, more than equal to the entire number of electric ranges in use at that time. Preliminary estimates for the year 1937 indicate sales of nearly 1,600,000 ranges, a gain of 10 per cent, a figure equalling the previous peak established in 1929. More cooking is done on a satisfactory new range than on an out-of-date and inconvenient old range. Modern ranges, how-

ever, require considerably less gas for the same cooking operations and there is some question whether any increase in the consumption of gas for cooking will result. However, the availability of these more efficient ranges strengthens materially the competitive position of the industry as regards its basic cooking load.

Many gas companies have recently inaugurated more favorable rates for house heating through central plan burners and equipment. It is estimated that the total number of gas central house heating installations connected to the lines of all United States gas companies in 1937 amounted to 735,000. In addition there were approximately 1,300,000 dwellings heated by unit heaters, space heaters, floor furnaces, etc., giving a total of more than 2,000,000 homes in the United States that are heated by gas.

The past year and a half has been characterized by an increasing appreciation of the great potential market for domestic water heating. There has been a widespread adoption of rates more favorable to the use of gas for this purpose. This has been accompanied by a marked acceleration of local sales effort and a nation-wide coordinated campaign to promote the use of gas for water heating. So successful have been the results of this program that it will be continued during 1938. For instance, the sale of automatic type gas water heaters during 1937 is expected to average more than 20% above 1936.

In recent years, the gas industry has supplemented the substantial amount of research conducted by gas appliance manufacturers by a vigorous and well-planned program of research and development through the American Gas Association. Even better and more efficient gas equipment will shortly be available, which should serve to enhance the competitive position of gas. Gas is also receiving increased recognition in the air-conditioning field, where control of humidity as well as temperature is required.

The use of gas for commercial and industrial purposes throughout the country is growing rapidly in volume. In many industries the increased use of gas was greater than the increase in production in those industries, and can be attributed to the increased use of many new and greatly improved pieces of industrial gas equipment. Because of this new equipment, industrial gas is more suited to supplying the refined heat requirements of industry than ever before.

Great strides were made in the metal industries where increased use of gas was noted in the small shops and in large mills for such important operations as open hearth heating and annealing. Annealing operations in both the ferrous and non-ferrous fields have been completely revolutionized by processes and equipment built around the use of gas. In the enameling industry, greater strides were made in applying gas than in any other previous year. Great progress was also made in the soft metal field.

In industry and in commercial establishments gas-fired unit heaters, which hang from the ceiling and force the heat in any direction needed, have met with much favor. This represents a new way of heating large factory buildings and accounts for large quantities of gas sold.

The many improvements in gas commercial cooking equipment account for increased sales of such equipment with consequent increased sales of gas in that bracket.

National Gas Advertising

Starting with the July, 1937, issues of ten national magazines and twenty-three trade magazines, the gas industry entered the second of its three-year \$1,500,000 national advertising program. Advertising messages appearing in two colors during the year numbered in excess of 100,000,000.

The purpose of this cooperative movement, supported by more than 700 operating companies, is the promotion of gas as a modern fuel for domestic, commercial and industrial purposes. A notable development the past year was the increased volume of advertising placed by the manufacturers of gas appliances, all of it tying in and adding weight to the national program.

The radio program featuring two talks a week by the Mystery Chef continued over thirteen Eastern and five Pacific Coast Stations of the National Broadcasting Company. Nearly 2,000,000 copies of a cook book entitled, "Be an Artist at the Gas Range" have been called for in person at the offices of participating gas companies by the Mystery Chef's radio fans.

Of great significance during the year, was the formation of the Home

Appliance Planning Bureau at Association headquarters. This bureau is about to launch a nationwide program for the equipment of new homes and the modernization of old ones by the installation of modern gas appliances. The first part of the program, a national architectural contest, will be announced to the architectural profession in March. Other phases of the

program, as presently planned, include a builders' contest for those who erect all-gas homes and the erection of prize-winning all-gas homes, fully equipped, at the 1939 New York World's Fair.

Another development of major importance was the setting up of specifications for a Certified Performance

(Continued on page 39)

PRELIMINARY ESTIMATES ON THE GAS INDUSTRY FOR 1937

Customers	1937	1936	Per Cent Change
Domestic (Incl. House Heating)	16,005,000	15,512,000	+ 3.2
Industrial and Commercial	1,017,000	993,000	+ 2.4
Total	17,022,000	16,505,000	+ 3.1
<i>Gas Sales (M cu.ft.)</i>			
Domestic (Incl. House Heating)	602,034,000	582,898,000	+ 3.3
Industrial and Commercial	1,090,310,000	991,009,000	+10.0
Total	1,692,344,000	1,573,907,000	+ 7.5
<i>Revenue (Dollars)</i>			
Domestic (Incl. House Heating)	531,923,000	522,110,000	+ 1.9
Industrial and Commercial	270,008,000	248,132,000	+ 8.8
Total	801,931,000	770,242,000	+ 4.1

MANUFACTURED GAS INDUSTRY

Customers	1937	1936	Per Cent Change
Domestic	9,296,000	9,063,000	+ 2.6
House Heating	207,000	172,000	+20.3
Industrial and Commercial	464,000	460,000	+ 0.9
Miscellaneous	9,000	9,000	—
Total	9,976,000	9,704,000	+ 2.8
<i>Gas Sales (M cu.ft.)</i>			
Domestic	195,077,000	198,199,000	— 1.6
House Heating	44,936,000	41,226,000	+ 9.0
Industrial and Commercial	113,227,000	101,640,000	+11.4
Miscellaneous	2,241,000	2,197,000	—
Total	355,481,000	343,262,000	+ 3.6
<i>Revenue (Dollars)</i>			
Domestic	256,818,000	258,924,000	— 0.8
House Heating	28,175,000	26,207,000	+ 7.5
Industrial and Commercial	74,286,000	70,884,000	+ 4.8
Miscellaneous	1,478,000	1,516,000	—
Total	360,755,000	357,531,000	+ 0.9

NATURAL GAS INDUSTRY

Customers	1937	1936	Per Cent Change
Domestic (Incl. House Heating)	6,502,000	6,277,000	+ 3.6
Commercial	502,000	487,000	+ 3.1
Industrial	42,000	37,000	+13.5
Total	7,046,000	6,801,000	+ 3.6
<i>Gas Sales (M cu.ft.)</i>			
Domestic (Incl. House Heating)	362,021,000	343,473,000	+ 5.4
Commercial	103,933,000	97,590,000	+ 6.5
Industrial	870,909,000	789,582,000	+10.3
Total	1,336,863,000	1,230,645,000	+ 8.6
<i>Revenue (Dollars)</i>			
Domestic (Incl. House Heating)	246,932,000	236,979,000	+ 4.2
Commercial	48,251,000	46,306,000	+ 4.2
Industrial	145,993,000	129,426,000	+12.8
Total	441,176,000	412,711,000	+ 6.9

What Makes a Gas Range Modern?

WHEN is a gas range obsolete? Wherein does the new gas range differ from the old? What are the salient features of the appliance on which we now depend to establish in the public's mind the supremacy of gas for cooking? What determines whether a gas range is modern? These are some of the questions which daily confront the gas range salesman. The purpose of this article is to present a comprehensive picture of the gas range today. An endeavor has been made to include most items by which the modern range is generally differentiated from the obsolete. Other developments indicated are definitely new in form if not in principle.

In the matter of performance, the gas range has forged ahead to a new peak this last year. Records of the Testing Laboratories indicate that regular (9000 B.t.u.) top burner thermal efficiencies have, on the average, reached a new high and are now over 20% higher than 5 years ago. Accompanying this has been a corresponding increase in the speed of such burners, the time required to bring 5 pounds of water to a boil having been decreased from about 14 to 11 minutes by this average improvement in thermal efficiency.

Larger burners of 12,000 and even 15,000 B.t.u. per hour input are appearing more frequently on modern ranges after having been virtually discontinued during early stages in the development of semi-closed tops. With these larger top burners, much faster performance is possible. For example, the time required for the operation indicated in the foregoing is about 9 and 7 minutes for the 12,000 and 15,000 B.t.u. burners respectively when operating at a thermal efficiency equivalent to that of the present average regular burner. Heat distribution characteristics of the regular and giant top burner have also been improved in many instances both for frying and

By **W. R. TELLER**

A. G. A. Testing Laboratories

for small utensils such as percolators.

Oven performance has likewise been improved appreciably in recent months. The two outstanding developments have been faster preheating and lower temperature maintenance. The former has been brought about by higher input rates in some cases and by use of more direct oven venting in others. Records show that the time required to preheat an oven to 500° F. has been decreased by nearly 1/3 in

"You will find the new gas ranges more flexible, more dependable and easier to use. They can be had with mantel backs to set flush with the wall, in line with modern kitchen planning. Top burners do not clog, do not go out, are easily controlled from high, quick heat to low, evenly distributed heat. Gas ovens have always given excellent baking results. They now give even better. Well insulated, temperature controlled, automatically lighted, enamelled for easy care, with high speed, smokeless broilers, gas ovens are in step with the best that is being done to provide better cooking facilities."—GRACE PENNOCK in the *Ladies Home Journal*, January issue, page 34.

recent years, much of this improvement having been noticed in the last twelve months. Many models will now preheat to 500° F. in 10 minutes or less and in one case a rather phenomenal preheating time of approximately 5 minutes has been observed.

Developments leading to low oven temperature maintenance have been quite recent and spectacular. It seems conservative to state that a substantial number of ranges today will permit maintenance of oven temperatures well below 300° F. with a stable by-pass flame and empty oven, while other models operate satisfactorily at temperatures as low as 200° F. Expert opinion in some quarters indicates that a 300° F. temperature in an empty oven is not too high for fruit cakes, oven canning, or other low temperature operations.

Successful low temperature maintenance has been brought about, in part, by invention of new control sys-

tems and, in part, by development of the small so-called "low-temperature" burner. Most substantial contributions to this latter development were made by the research findings of the Committee on Domestic Gas Research under the chairmanship of F. J. Rutledge.

Broiler speed and performance of current models will be found to be much superior to that of older ranges. At the present time, broiler temperatures on many models will reach 600° F. above room temperature in less than 15 minutes whereas 20 min-

utes for this operation was typical performance only a few years ago. Use of ceramic and metallic materials to increase the radiant component of heat liberated has contributed to improved speed and uniformity of heat for broiling and toasting operations. The "low-temperature" burner mentioned in the preceding paragraphs has likewise proven to give im-

proved performance in these important respects. Use of "smokeless" type broiler racks and pans is also a distinct improvement found in recent models.

Improvement in the insulation of both broiler and oven compartments is also noticeable and has been brought about by better application and, in some cases, by greater thickness of insulating materials. Such advancements make themselves felt to consumers in lower gas bills, cooler kitchens, and reduced oven surface temperatures.

Certain factors of gas range construction are generally placed in the category of convenience features although definitely related to performance. Among these are the many types of mechanical contrivances used on broilers by which the food can be raised or lowered in respect to the burner or withdrawn entirely from the broiler compartment by operation of the broiler drawer or external handle



One of the latest model gas ranges is shown here in an attractive setting. Note the gas cocks on the back panel and the swingout smokeless broiler. Other features are a divided top, high lamp and condiment set and a spacious oven

and without requiring handling of the broiler rack itself. This feature is becoming increasingly evident on new model gas ranges and yet is not found on many deluxe electric ranges. A similar feature will be noticed in the oven sections of certain models of gas ranges which are provided with mechanical means to withdraw the oven racks. Another noteworthy and new convenience feature found on many modern gas ranges is the device in-

dicating when the oven has reached its correct predetermined temperature.

The top section of gas ranges has also received attention in the matter of convenience features that make for better performance. For example, the recent advent of gas burner valves having a stop at the simmering position makes it possible for the housewife to obtain quickly and accurately a small flame for simmering purposes. Different arrangement of top burners

such as four in a line, divided tops, and staggered patterns permits fuller utilization of the cooking top particularly for larger sized utensils. Contribution of the combination simmering and main top burner (double-duty burner) to the convenience and excellence of gas cooking is so well appreciated as to need little comment.

Convenience features on both top and oven sections which add to cleanliness and ease of cleaning are more numerous and satisfactory than ever before. Almost invariably it will be found on top sections of new ranges that burners are of a type on which the ports do not clog readily when foods boil over, and that enameled or bright metal parts are employed which are



This range has a steam table and a griddle top. It also boasts a large oven in addition to a conventional oven



Oven heat control with visual temperature signal is a highlight of this range. It has an illuminated low-temperature oven, radiant nichrome broiler and flush construction



Note the spread lamp on this model, which includes such attractions as mantle back construction, open top and metal broiler in addition to other new developments



A minute minder is prominent on this new range. It also boasts a large oven, high and low temperature oven and broiler burners, and two cover tops

not only easy to clean but provide an incentive for cleanliness. In the ovens we will find linings and oven bottom covers which can be readily detached and taken to the sink for cleaning. On some models, the entire top section is hinged or removable to provide access to the burners and tray. As always, burners are readily removable for cleaning purposes.

In our contacts with the public, it would seem well to emphasize that regardless of what form of energy is employed, food which is boiled over or inadvertently dropped on the top section is very likely to fall on the burner or heating unit. Gas range manufacturers know that this frequently happens and have designed

This is one of the series of gas advertisements appearing in national magazines which points out the great advances made in gas ranges in recent years. Special new features are played up in copy and photographs which emphasize the modernity of gas appliances



A 1938 model which is a good illustration of the flush-to-wall construction which is popular today. It also has a large oven



This range has a number of interesting features, including spring balanced drop-back top covers, large oven, elevated broiler with bar-type burner in combination pastry oven, two oven heat controls, timer and electric clock. Inset shows the six-burner top arrangement, giving a center work service



about the amazing
new **SPEED**
features of the
Modern Gas Range



New high speed burners utilize a special material that radiates heat from the burner, raising broiling temperature as high as 750°. The intense heat cooks quickly through while the bottom cooks slowly, without danger of burning. Perforated grills drain off fat—so that modern gas broiling is as effortless as soft as fat!

Modern gas ovens reach a temperature of 300° in as little as 8 minutes—about 1/2 the time they used to take. In addition, they are more "precise" than ever. Automatic heat control adjusts exact cooking temperature set the dial at the degree you wish. Improved oven insulation keeps kitchen comfortably cool.

Intense heat, the instant you turn the top burner handle! Boiling begins more quickly on a gas range than with any other type of fuel. The flexible gas flame makes possible countless heat gradations. Specially designed summer burners are adapted for "water-line" cooking which saves vitamins and minerals in vegetables.

the top section accordingly, whereas electric range manufacturers apparently with complete but blind faith in the "cleanliness of flameless cooking" myth seem to have done much less in this direction.

New gas ranges are in many cases much more easily to service than heretofore. Orifices, air shutters, pilot valves and thermostats are readily accessible for easy installation or readjustment. These improvements have been effected, for example, by use of removable or hinged tops, readily detachable manifold or cover plates, and relocation of oven thermostat pilot and by-pass adjustment screws. Such changes as these while not generally of apparent worth to a consumer are, of course, extremely important in elevating standards of gas service. An increasing amount of attention has also been given to constructing gas range bodies so that side and top sheets may be readily removed and replaced when necessary.

There have been considered thus far only the three basic sections of a cooking appliance. In modern ranges the trend to specific applications of heat for particular

cooking operations has become quite noticeable. These new and useful applications are most encouraging in that they tend to place our industry on an aggressive rather than a defensive competitive basis.

An example of a step in this direction is the griddle section found on many ranges. Here is a part of a gas range, complete and self-contained, in that it requires no separate utensil for utilization, which performs its intended function perfectly and is, we believe, unique with gas. Recently,



The pastry oven illustrated in this range represents a definite trend. This model also has the open top, mantle back construction and bigger broiler

there has been offered a steam table embodied in a range in the position usually devoted to the utensil drawer. This part is likewise complete and self-contained and serves a new and useful purpose. Thermal wells, that is, utensils located in covered recesses in top sections, are also illustrative of the point but are neither new nor unique with gas.

One of the most important of recent developments is the small pastry oven supplementing the ordinary baking oven. Such ovens are not only useful in affording better conditions for specific operations, but permit in conjunction with the regular oven two simultaneous baking operations at different temperatures. Moreover, these smaller ovens are naturally more economical and liberate less heat into the kitchen. On this last score they are valuable in meeting competition from separate roasters.

New Oven Development

To illustrate what can and has been accomplished there was recently developed, as an integral part of a gas range, a small oven of unusual design in which operations ordinarily performed at different temperatures can be accommodated at the same time. The writer had the pleasure of partaking of broiled (low-temperature) filet mignons, vegetables, and pie cooked in this oven simultaneously. Such performance certainly excels the separate roaster.

Before leaving the range to its future, there should be mentioned the toaster, the broiler pan of sufficient heat capacity that after preheating allows broiling without turning, utensil drawers on ballbearings, cutlery drawers, oven lights, ornamental lights, time clocks, built-in timers or minute-minders, integral oven flue deflectors to protect walls and flush construction permitting location of the range back directly against the wall. Porcelain enamel bodies and oven linings now taken for granted were done without only a few years ago. Automatic ignition and thermostats are in a like category. Developments in these matters have generally been in the nature of gradual and continual improvement.

Manufacturers today maintain at

considerable expense research and development departments to keep alive the spirit of progress. Utilities cooperate in these endeavors and in addition strive to improve those conditions directly within their province. Both branches of the industry in turn join

together through their Association to undertake fundamental research and promote other activities of mutual interest. The industry may, consequently, look forward to even greater developments in the near future than we have witnessed in recent years.

"House Livable" Wins Prize in Home Name Contest

JUDGES of the contest conducted by the A. G. A. Home Appliance Planning Bureau to secure a name for the all-gas homes to be constructed in the nationwide architects' and builders' program, unanimously awarded the \$200 prize to Charlotte Redfield, home economist of the Portland Gas and Coke Company, Portland, Oregon. "House Livable" was the name which won for Miss Redfield from scores of home service directors and assistants throughout the country who submitted entries in the contest.

In the text giving reasons for her selection, Miss Redfield wrote: "The four modern gas services have given the public the most livable home ever designed. Comfort due to even, controllable temperatures, convenience because of ease and efficiency of operation, and beauty of appliances com-

bine to make every room in the house livable—from the basement to the upstairs bedroom."

The contest closed December 15 and was judged December 20. The judges were: Katherine Fisher, director, Good House-keeping Institute; Ruth Osborn, Congoleum-Nairn, Inc.; Eloise Davison, director, New York Herald Tribune Institute; Ruth Goodhue, managing editor, *Architectural Forum* magazine; J. Harold Hawkins, architectural editor, *McCall's Magazine*; Jesse Haight, Wilson and Haight, Inc., Hartford; and J. F. Quinlan, director, Home Appliance Planning Bureau.

Major Alexander Forward, managing director of the Association, sent a congratulatory telegram to Hilmar Papst, vice-president of the Portland Gas and Coke Company, informing him that an employee of the company had won the contest.



King Photo

Judges in the name contest. Left to right, seated: Katherine Fisher, director, Good House-keeping Institute; Ruth Osborn, Congoleum-Nairn, Inc.; Eloise Davison, director, N. Y. Herald Tribune Institute; Ruth Goodhue, *Architectural Forum*. Standing, left to right: J. F. Quinlan; J. Harold Hawkins, *McCall's Magazine*; and Jesse Haight, Wilson & Haight, Inc.

The Action of Frost on Buried Pipe

MANY gas utilities situated in the northern and western parts of this continent are troubled in winter by a certain number of breaks in their distributing mains, that are attributed to the action of frost. Although such damage sometimes occurs to a serious extent, no account appears to have been published of the way in which the freezing of soil can break a pipe. The causes of movements at the surface of frozen ground, however, have been investigated from the standpoint of highway engineering, and the findings of this work are here applied to the case of buried piping.

CAUSES OF MOVEMENTS IN FROZEN SOILS

Volume Expansion of Contained Water

It is believed to be commonly assumed that frost heaving is brought about by the familiar ten per cent expansion in volume of water changing to ice in the soil. A little consideration of the phenomenon of frost heaving, however, shows that this factor is of minor importance. If soil containing forty per cent of its volume of water, which approximates saturation, were frozen solid to a depth of three feet, and if all the resulting expansion took place upwards, the surface would rise less than one and a half inches. Upward heaving of a foot or more is occasionally observed, and heaves of six or eight inches are common. Furthermore, it is a common experience that when an enclosed body of water freezes, its force of expansion is exerted in all directions. Horizontal forces in freezing soils are never observed, and indeed would be quite disastrous in effect if they did exist. Consequently, these large surface lifts must be due to some other factor incident to the freezing of soils.

The Formation of Ice Layers

The following discussion of the mechanism of frost heaving is a digest of the available literature on the subject. For a more detailed account of

By J. E. MACONACHIE

Research Fellow in Gas, Ontario
Research Foundation, Toronto

the experimental investigations upon which it is based, the papers listed at the end of this article should be consulted, particularly that of Stephen Taber, in the 1930 volume of the *Journal of Geology*.

These investigators have found that large movements in soils are caused by the growth of successive layers of clear ice as the frost penetrates deeper into the ground. These ice layers are composed of water drawn from the surrounding or underlying soil, and this water may come from considerable distances. The total thickness of the ice layers under any particular point on the surface, may amount to several inches, and the surface above them is lifted an equal distance. The manner in which it is believed these layers of ice are formed, and the direction and magnitude of the forces they can exert, are treated in detail in the succeeding paragraphs.

Manner of Growth of Ice Layers

During cold weather heat is continuously radiated from the surface of the ground and is conducted upwards from the warmer soil beneath. The top few inches of soil may freeze quickly, but thereafter the level at which the temperature is at the freezing point moves downwards more and more slowly due to the insulating effect of the frozen ground above. The top mass of frozen soil is in effect dry and water is drawn to it from contiguous moist soil. This water, upon reaching the under side of such a mass, is frozen there, forming a layer of clear ice from which heat is conducted upwards, and which is kept wet continuously on its under side. It therefore grows in thickness in a downward direction until the water supply to it is interrupted. The available supply of water may become exhausted, or more often, the pores of

the underlying soil may be blocked by ice. In the latter case another layer may begin a little distance below the first, and the whole process be repeated again and again, being limited finally only by the depth to which freezing temperatures penetrate.

Conditions Affecting the Growth of Ice Layers

Knowledge of the mechanism by which ice layers are formed enables us to analyze the effect of different conditions on their growth. Two circumstances appear to be necessary for their development, a slowly penetrating line of freezing, and a sufficient supply of water from other regions to the freezing zone. Very fast freezing, by keeping always ahead of the possible rate of growth of ice layers, may preclude their formation altogether. Slower freezing gives rise to a large number of relatively thin layers, and still slower freezing a few thick ones. The rate of penetration of frost is, of course, primarily dependent upon the weather, and also upon the presence or absence of an insulating blanket of snow or other kinds of cover. Continuously cold weather, rather than alternating high and low temperatures, and a minimum of snow are the conditions most favorable for the growth of ice layers.

The second circumstance mentioned as important, the availability of water, is less easily dealt with. Agreement as to the exact mechanism by which water is drawn to the freezing zone from deeper or adjacent soils, has not yet been reached. However, a precise accounting for this phenomenon is not necessarily pertinent to this report. It will be sufficient to say that water is so transported, and most effectively by soils consisting of particles of small diameter, such as clay, silt, and fine sand. In coarser materials, such as coarse sand or gravel, water may be forced to the freezing zone under some pressure due to a nearby high water table or some other special condition of local topography and drainage.

To summarize, heaving due to the growth of ice layers is most likely to occur in fine grained soil, uncovered with snow and supplied with abundant water from below, during long continued spells of cold weather, and is not likely in coarse or dry soil, or during variable climatic conditions.

Direction and Magnitude of Forces

Since ice layers, by the mode of their formation, only grow downwards, they can exert a force only in a vertical direction. The magnitude of this force can be determined only approximately, and will vary widely depending upon the particular circumstances affecting growth. In laboratory experiments on freezing clay, vertical forces of the order of two hundred pounds per square inch have been developed, while at the same time, paper cylinders containing the clay samples were unbroken, showing the absence of any horizontal force components. Such forces were secured under ideal conditions, but the figure quoted may be taken as a useful indication of the maximum pressure that may be encountered.

EFFECT OF HEAVING ON PIPE

Ice Layers Growing Above a Pipe

From the above discussion, a pipe may be subjected to stress from above or below by growing ice layers, but never sideways. Considering first the case where ice layers are being formed above, there will be a pressure developed on the top of the pipe. But this force will be limited to that necessary to lift the soil above the ice layer, a matter of only a few pounds per square inch. Any downward movement resulting from such small pressure would be taken up by a compacting of the soil immediately below the ice layer, and would only affect a pipe if the ice layer were developed close to it. As the presence of the pipe itself would interfere to some degree with the free passage of water to such a layer, and as the pipe is kept, by the passage of gas or water through it, at a little higher temperature than the soil around it, when the latter is freezing, ice layers immediately above a pipe are most probably rare. It may be concluded that any considerable pres-

sure on a pipe caused by freezing in the soil above it is unlikely.

Ice Layers Growing Below a Pipe

In the case of ice layers growing below a pipe, the latter may be subjected to a lifting force of anything up to two hundred pounds per square inch. For instance, a pipe may be rigidly encased in frozen gravel throughout its length except for a section which passes through a bed of clay. Ice layers forming below this section would lift the clay were it not for the resistance to such a movement offered by the pipe. In these circumstances a six-inch cast iron pipe could be broken by an ice layer four feet across.

Ice layers twenty feet long are common, and would have to exert a force of only ten pounds per square inch to break a six-inch pipe. Just as effective as a single large layer would be a piece of soil of comparable size filled with a large number of small layers of ice, so that damage to a pipe is likely whenever frost penetrates below it under conditions favorable to the growth of ice layers.

Preventive Measures

Damage from frost may, of course, be eliminated by burying pipe everywhere deeper than the frost ever penetrates. But it might be prevented much more economically by logical application of the above discussion. Pipe need not be so deeply covered in coarse sand or gravel, or in soil known to be dry. In moist clay, the trench may be dug a foot deeper than it is intended to place the pipe, and the pipe supported on that depth of gravel. The type of cover above the pipe is probably immaterial. In the case of breakage in existing systems, a repetition of trouble at the same point might be prevented by removal of fine soil and substitution of gravel below the break for twenty or thirty feet on either side at the time of repairing. Analogous precautions have been uniformly successful in preventing the heaving of highways.

OTHER CAUSES OF DAMAGE

It is not intended that the formation of ice layers be considered as the

only way in which frost can damage a distribution system. It may be of greater or smaller importance relative to stresses imposed by unequal expansion and contraction of pipes and soils, or by the unequal settling of fill and other heterogeneous material encountered in cities, which takes place when the ground is softened by thawing in spring.

The importance of all these possible factors might be appraised by a detailed survey of the nature and location of breaks attributed to frost action, and a correlation of experience in different cities where such damage is encountered. But the formation of ice layers at least constitutes a potential cause of breakage that is based on known facts, that has been proved to be important in the construction of highways, and that could account for differences in the amount of frost damage in different localities having nearly the same climate.

(This article is published by permission of the Consumers' Gas Company, Toronto, and is based on a report made to that company by I. J. MacHattie of the Ontario Research Foundation.)

BIBLIOGRAPHY

1. The Growth of Crystals under External Pressure—Stephen Taber, *Amer. Jour. of Sci.* 41, 532, 1916.
2. Pressure Phenomena Accompanying the Growth of Crystals—*Proc. Nat. Acad. Sci.* 3, 297, 1917.
3. Highway Engineering Problems—B. R. Burton, *Eng. News Record*, 100, 624, 1928, *Engineering Index*, 1928.
4. A Soil Pressure Cell—*Instruments*, 2, 295, 1929.
5. Frost Heaving, Stephen Taber, *Jour. Geol.* 37, 428, 1929.
6. The Mechanics of Frost Heaving—Stephen Taber, *Jour. Geol.* 38, 303, 1930.
7. Frost in Road Subgrades—B. R. Burton and A. C. Benkelman, *Eng. News Record*, 106, 266, 1931.
8. A New Theory of Frost Heaving—A. C. Benkelman and F. R. Olmstead, *Amer. Highways*, 11, 13, 1932.
9. Ice Pressure Determinations in Clay Soils—A. Casagrande, *Eng. News-Record*, 115, 127, 1935.

"Leads" by Employees Result in Sales

LEADS turned in by employees of the Public Service Electric and Gas Co., Newark, N. J., resulted in 472 installations of gas house heating during the first ten months of 1937. This is a 34.9 per cent increase over the number of installations made as the result of employee leads during the first ten months of 1936.

Another indication of what the energetic and cooperative effort of employees can do is the fact that, in the first ten months of 1937, 1,415 automatic gas water heaters were sold as the result of leads turned in by employees.

New Gas Decorating Kiln Developed at Lenox Potteries*



Full-length view of the new hot-tube gas recirculating decorating furnace at the plant of Lenox, Inc. Some of the ware may be seen on the racks. (Inset) Close-up of the firing zone of the new gas decorating kiln. The gas line valves, thermocouples and pressure gages can be seen in detail. Note also the springs on the ends of the conveyor hearth rollers.

FLEXIBILITY of firing, uniformity of heat distribution and economy in fuel costs have been obtained by the recent installation of a recirculating, gas-fired, metallic tube decorating kiln at the plant of Lenox, Inc., Trenton, N. J.

The new kiln is 51 ft. long. The cross section of the ware space is 25 in. wide x 13½ in. high. The ware is loaded on light weight alloy carriers comprising an open grid covered with an expanded nickel mesh tray. The carrier, which is 25 in. x 27 in.,

weighs only 22 pounds. Average output of the kiln is 50 such carriers of ware per 24 hours.

On a 16-hour test, during which all the ware and supports were carefully weighed, it was found that the total weight of chinaware passed through the kiln was 1,343 pounds, that of the kiln furniture 2,274 pounds and of the loading trays 642 pounds, making a total of 4,259 pounds. The temperature was maintained at 1370° and the total fuel consumption during the 16 hour period was 7,968 cu.ft. of city gas, having a gross heating value of 525 B.t.u.'s. The fuel cost, it is said, was \$2.79 for the 16 hours, based on a price of 35 cts. per M feet.

This kiln is of particular interest

because it represents the culmination of the second step in the research and development program undertaken six years ago jointly by the Committee on Industrial Gas Research of the American Gas Association, Lenox, Inc., and Public Service Electric & Gas Company. The first step concerned glost firing and after extensive research, during which the Department of Ceramics at Rutgers University acted as consultant for the research committee,

methods were devised for glost firing on a 24-hour cycle and in a semi-indirect gas-fired furnace. The kiln that was finally developed and ultimately placed into operation for this process incorporated, among other features, what is believed to be the first successful, permanent application of walking beams operating at these temperatures in the ceramic industry. The committee was instrumental in the development of gas radiant tubes and sponsored the first application to the porcelain enamel field.

The new decorating kiln is equipped with a total of 15 horizontal 3" recirculating gas tubes, of which 12 are installed beneath the conveyor and 3 above the conveyor. Of these 6 of the bottom tubes are located in the pre-heating zone and 3 in the cooling zone. In the furnace zone there are 3 tubes top and bottom.

The temperature of the furnace zone is maintained constant by means of a full floating type automatic temperature controller. This adjusts at all times the fuel input to the amount of deviation from the set temperature so that over-running and hunting are

* Reprinted from "Ceramic Industry," December, 1937. Much data contained in this article has been obtained through courtesy of Eugene D. Milener, Sec'y, Committee on Industrial Gas Research, American Gas Ass'n, Philip Dressler, Swindell-Dressler Corp., and L. S. Briggs, Lenox, Inc.

avoided. The automatic temperature control valve is installed in a by-pass so that only a fraction of the total volume consumed is under control, the larger portion being fired constantly to the burners. It has been found that this permits of a more accurate and sensitive control than where the full volume passes through the control valve.

Cooling Section

The tubes in the cooling section have been found quite useful in controlling the rate of cooling in the critical range, so that all kinds of ware can be safely cooled on the relatively fast cycles used in this kiln. While tubes have been provided throughout the preheating zone it has not been found necessary to use those nearest the entrance of the kiln, the heat derived from the furnace section being sufficient to preheat the ware at a satisfactory rate.

The tubes are fired with a perfectly proportioned gas-air mixture supplied from regular carburetor. This system is one which has been utilized for many years to supply an accurately controlled intimate mixture of gas and air. The gas is supplied to the intake side of the mixing fan through a zero governor, which reduces the gas to atmospheric pressure. Air is drawn directly from the atmosphere through an air filter. The air and gas pass into a ratio valve by means of which the proportion is held constant, re-



A view of the entrance end of the kiln, with some ware placed on racks for decorating.

gardless of the volume discharged by the mixing fan. On the outlet side of the fan there is provided a back-fire preventer, which serves to prevent an explosion wave from passing back into the fan should the mixture in the line become ignited.

Beyond this is a mercury gage and a pilot flame. The latter permits visual adjustment of the mixing valve. With experience it is not difficult to adjust the gas-air ratio to almost theoretical perfection by observation of the pilot flame. The gas-air mixture is delivered by the fan at a pressure of approximately 20 oz.

Each tube is equipped with a burner and auxiliary equipment comprising a dial valve, back-fire preventer and mercury pressure gage. The burner head is located inside the tube adjacent to the return loop. The injection force of the gases leaving the burner head serves to produce a rapid recirculation of the gases in the tubes, which creates an even distribution of the heat throughout the whole length of the tube.

Even Heat Distribution

It is interesting to note that although all the tubes are fired from the same side of the kiln there is no detectable difference of temperature from side to side of the loads of ware fired through the kiln.

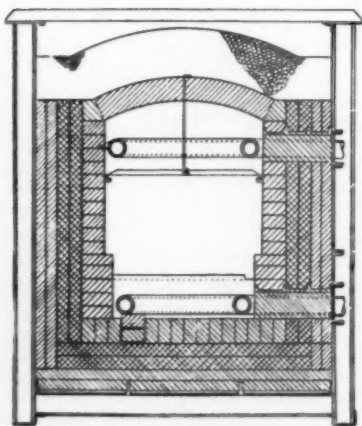
Each individual burner can be ad-

justed to give the desired fuel input by means of the dial valve, the effect of increasing or decreasing the fuel being shown on the mercury gage. Burner heads of various capacities are available and for each tube a burner head is chosen which will normally operate between the pressures of 10 oz. and 20 oz., in this way securing a satisfactory rate of recirculation of the gases in the tubes.

Three types of decorated ware are fired with little manipulation of the burners and the speed of the conveyor. The colored ware is treated with 1,370° F., the china at 1,250° F., and the gold at 1,370° F. Colored ware loads enter the kiln every 40 min., while china fired and gold fired ware enter every 25 min. While the temperature is being increased from 1,250° to 1,370°, dummy loads are sent through carrying ware which requires two fires for completion. The total firing time on the former is 14 hours, while on the latter, it is 8 hours, 45 min. It requires only 30 minutes for this increase, but it takes 45 min. to cool down from 1,370° to 1,250°, due to the retainment of heat in the well insulated chamber.

Economical Shut-down

Each week-end the furnace is shut down, which eliminates the building up of the supply of ware which might



A cross-sectional drawing through the high temperature zone of the new decorating kiln, showing positions of the gas heating tubes.

accumulate dust or dirt while lying in the shop during that time. It is started again on Sunday night and made ready for regular production the following morning. Two hours after lighting, ware is started through the kiln. During the regular firing, eight burners are used, but during the heating-up period, two extra open-fired burners are employed. By closing down over the week-end, labor operating charges are saved, together with

a net saving of 12,000 ft. of gas, it requiring only 6,000 ft. of gas to bring kiln up to operating temperature.

It was found that there was a lag on the recording instruments when the temperature was boosted. To overcome this, the protecting tubes of the Chromel-Alumel thermocouples were removed and the wires exposed to the direct heat, thus producing a rapid response to changes in temperature.

Kitchen Planning the Gas Way

IN line with the American Gas Association's national program of kitchen modernization the San Diego Consolidated Gas and Electric Company has just completed a combined store and window display of a model gas kitchen. The display was introduced to the public through a series of 15-minute radio broadcasts direct from the kitchen and if public interest is any indication of a successful display, then San Diego's model gas kitchen will pay for itself in short order.

Ralph Phillips, engineer in charge of gas sales, who supervised the construc-

tion and arrangement, explains the display as follows:

"Since cleanliness is utmost in importance, we have used white enameled steel cabinets throughout with Monel metal work tops. There are no ridges to catch dirt and make cleaning difficult, and only a few minutes work after each meal will keep such a kitchen immaculate. There is a charming little planning desk, all steel with linoleum top, where supplies can be ordered and menus prepared. The color scheme of white, pastel yellow and dark blue will blend with almost any home decoration."

One man on each shift gets the ware from the decorating shops, loads the trays and unloads the ware at the cooling end.

At the exit end of the kiln there is provided a small fan connected to a nozzle just inside the door. This serves to prevent heat from escaping from the kiln when the door is opened and also produces a constant displacement of the atmosphere toward the entrance end of the kiln where it is exhausted, carrying out the size fumes from the decoration. Automatic controls are provided on the exit door which stop the drive when tray reaches the end of the kiln unless the door has previously been opened to remove this tray.

The hearth is a roller chain conveyor with a variable speed. Any change in the firing cycle is made by adjusting the speed of the conveyor.

John S. DeHart Jr. Is Dead

AS this issue of the MONTHLY goes to press, word has been received of the death of John S. DeHart, Jr., president of Isbell-Porter Company, Newark, N. J., and one of the outstanding leaders of American Gas Association activities since its organization in 1918. At the time of his death Mr. DeHart was a director of the Association, chairman of the Finance and Control Committee, and chairman of the A. G. A. Laboratories Managing Committee. He was a charter member of the American Gas Association.

Mr. DeHart was chairman of the township committee of Maplewood, N. J., where he resided, a position corresponding to that of mayor in other cities. He was held in such high esteem by citizens of Maplewood that a testimonial dinner was organized for him December 2 by a committee of citizens representing all parts and various organizations of the township. This affair was referred to at the last meeting of the Association's Executive Board.

Further reference to Mr. DeHart's great work in the gas industry will appear in the February issue of the MONTHLY.

Equipment is half the battle in our industry. Imagine where we should be if the public were to receive, or be allowed to buy, stuff that cannot use gas properly. When you think of the opposite side of the picture you can realize more fully just what the (A. G. A.) laboratories are doing for the industry. I think the industry would not exist, could not exist, without them.—President Munro of the Canadian Gas Association.



Combined window and store display of a model gas kitchen in San Diego

From Platinum Blondes to Gas Kitchens



Deke Houlgate

WHEN the late Jean Harlow allowed her lovely head of hair to be tinted a glamorous, silvery gray for her first starring appearance in Howard Hughes' \$4,000,000 production "Hell's Angels,"

she started something, unwittingly, that was to give women a new concept of hair dressing and put a hitherto obscure business very definitely in the industrial sun.

Until then, American women resorted to dye only when the silver threads began to betray their years. It was the happy phrase "Platinum Blonde," fastened upon Jean by an inspired publicity man, that focussed women's attention on the screen player's hair and sent them willy nilly to the beauty shop to try the same chemical route to loveliness.

An Industry Lesson

The business of beautifying women, previously far down in the lower reaches of the economic world, took a sudden upsurge that carried it to seventh place in the scale of investment and returns. Its ramifications today are infinite and amazing; and there is no doubt whatever that the chance tinting of Jean Harlow's hair was the thing that started it.

It is a big jump from platinum blondes to gas ranges; yet the success story of the beauticians really has a lesson for the manufacturers of gas ranges and for the gas industry in general. That lesson in a nutshell is simply this: Everything a member of Hollywood's mythical community does, says, wears and even at times thinks, both on and off the screen, is almost sure to be copied, adopted or imitated.

The truth of this statement is so well known that a number of minor industries have sprung into being to capitalize on public demands thus created. Instead of purchasing gowns

By **DEKE HOULGATE**

Hollywood, Calif.

for stars such as Garbo, Crawford, Francis and Dietrich to wear in a picture, studios now call in the world's finest designers. Special wardrobes for use only during a picture are created. And while the filming proceeds, clothing manufacturers speed production of thousands of copies of these same dresses, confident that many feminine fans will leave the theater remarking, "I want a dress like Greta wore. . . ."

The gas industry can hardly be called asleep with regard to this phenomenon, although it took the set dressers of Hollywood, in their eternal search for something new and differ-

ent, to point the way. They were among the first to recognize the renaissance in gas appliance design a few years ago, and with each improvement or increased eye-appeal given the kitchen came requests from many studios that they be loaned equipment to place in kitchen sets. Definite steps were soon taken to make modern gas appliances quickly available, and resulting tie-up advertising or publicity campaigns worthwhile.

Assured of cooperation, the complex business known as motion picture production increased the opportunities for screen display of modern gas ranges, water heaters and refrigerators.

While the results can hardly be tabulated or appraised, millions of housewives and bread winners are today catching glimpses of their screen fa-



The Technicolor camera is used throughout the new Pete Smith production, "Penny's Party," a Metro-Goldwyn-Mayer picture featuring Prudence Penny and modern gas appliances.



That happy smile belongs to Prudence Penny who appears in the new production, "Penny's Party," a Metro-Goldwyn-Mayer picture, in Technicolor. Maybe Miss Penny's joy is due to that gas refrigerator.



Yes, most decidedly, it's a gas range that is used for the picture, "Penny's Party." Gwen Lee is seen manipulating one of the modern gadgets!

avorites in close proximity with a beautiful console range, or the latest thing in water heaters or a smart gas refrigerator. If Anna Held could start a fad for baths in milk, or Ted Peckham could revive the almost lost sport of bicycle riding, what can prevent a wave of popularity originating in Hollywood from helping to change America's kitchens into "things of beauty forever!"

Kitchen Pride

It has been said that Cecil DeMille called the world's attention to the bathroom, with the result that today the modern hostess is as proud of that once unmentioned chamber as she is of her living room, grand piano and all. That trend is continued with growing impetus today as regards the kitchen, with guests being escorted through the home for a glimpse of range, refrigerator and shining sink.

Mae West popularized the hour glass figure for a brief time, and Marlene Dietrich put slacks on nearly a third of the nation's women, but these were fads.

The gas industry is not attempting to make the ownership of kitchen appliances a fad. It is not the intention to coax the housewife into trading last year's range for this year's model. What is anticipated, however, is that every homemaker will want an attractive kitchen and one utilizing all-gas equipment will spell not only beauty but comfort and economy as well.

Perhaps the most effective way Hollywood is impressing the American housewife that the gas kitchen is the one for her is by dressing the large majority of its modern kitchen sets with the latest models of automatic gas equipment. Among the hundred odd productions which displayed appliances on the screen during the past twelve months, movie goers will recognize the titles of such outstanding entertainment features as "Easy Living," "Oh Doctor!" "Meet Nero Wolfe," "Everybody Sings," "Penrod and Sam," the Jones Family series, and Pete Smith's technicolor short, "Penny Wisdom."

This, however, is but one phase of the motion picture influence. In South-

ern California where the thousands of players, technicians and executives who make up the industry's personnel have their homes, natural gas is the number one fuel, and most of the homes these people live in have all-gas kitchens.

For example, Darryl Zanuck, William Goetz and Joseph M. Schenck, top executives at Twentieth Century-Fox, purchased deluxe gas ranges in recent months; in the home of Samuel Goldwyn is a custom-built gas range and a two-door Electrolux; Fred MacMurray chills his ginger ale in the newest model gas refrigerator; the meals of Louis B. Mayer are prepared on a large gas range; in H. B. Warner's home is a special range complete with the name plate of the Warner Brothers executive; Don Wilson, screen and radio star, just moved into a beautiful new home with an all-gas kitchen; and the inimitable Bob Burns has a kitchen 100 per cent gas equipped.

To name additional headliners who prefer gas equipment to other types would require too much space. The gas kitchen is the choice in Hollywood, and that's that.

The Trial Period Heating Plan—Direct and Indirect Results



H. S. Green

THROUGH newspaper advertisements, direct mail circulars and handbills we announced on July 1, 1936, that for a period of time expiring October 20, 1936, we would install heating appliances,

without any cost to the consumer, for a trial period covering one heating season.

The free Trial Period Merchandise Plan, in brief, was a promotional idea to stimulate the utilization of gas heating and to provide a plan whereby the somewhat skeptical, overly cautious and conservative type customer would have an opportunity to try out gas heating equipment at our expense. Our aim, in addition, was to create a "gas-minded" heating public.

Consumer Contract

From the consumers' viewpoint the plan was extremely simple: First, a signed contract by and between the consumers and our company. Second, selection of the appliances to be installed in the homes or places of business. This selection was influenced and approved by the division and local managers. Third, the installation of the appliances by our company employees absolutely free of charge.

The aforementioned contract consisted of terms and conditions by which the customer agreed: to purchase gas from our company for his entire fuel requirements for one heating season; to allow the company to remove the equipment if, in their judgment, reasonable care was not being taken of it by the customer, if it became damaged or if the premises were vacated and to maintain said equipment in good and efficient condition. The customer also agreed to allow employees of the company to

By H. S. GREEN

General Manager, The Central West Utility Company (Missouri and Kansas)

enter the premises and examine said equipment at all reasonable times. The company agreed to give the customer an option to purchase the appliances on one of the company's regular purchase plans (one- two- and three-year basis) or purchase same for cash; otherwise, the company retained ownership of the equipment.

During the same period the company offered to construct service lines (not exceeding 100 feet) for only \$1.00, providing, of course, that the new customer agreed to heat with gas for one heating season and signed the Trial Period Merchandise Plan contract.

Company's Job

From our viewpoint the plan was not so simple. After arrangements to finance the plan had been made and the most desirable merchandise had been decided upon, it was necessary to temporarily increase our personnel in order to make this plan a success. We divided our properties into territories over which we placed carefully selected salesmen on a straight commission basis. Hourly laborers were employed to make the installations when the work exceeded the capacities of the regular employees.

We selected our merchandise for this free Trial Period Plan with the following points in mind:

1. Heating appliances that could be installed in homes with and without furnaces.
2. Appliances simple in design and suitable for the average home.
3. Appliances of sturdy construction that would withstand the wear and tear of being moved about in case the consumer did not eventually purchase.
4. Appliances that varied in size and price in order that they would be appealing to as many consumers as possible.
5. Appliances that were modern and efficient in operation.

Each local manager was held directly responsible by the division manager for the manner in which the installation was made and the operating efficiency of the appliance installed. Each manager paid particular care that no appliance was installed in a home or place of business wherein the occupants were financially unable to assume the responsibility of paying the monthly gas statements and purchasing the equipment in the event a sale were made. The credit rating for each trial consumer was carefully analyzed before approval was given by the division manager to consummate the transaction.

The uncollectible gas bills for the entire property for all purposes for the fiscal year in which the trial plan was in operation amounted to 29/100 of one per cent. Less than two per cent of the trial jobs installed failed to remain in operation for the entire heating season.

Appliance Survey

After the heating equipment had been installed a survey was made by our service men to ascertain that all appliances were operating as efficiently as possible. At the same time the consumers were interviewed to determine whether or not gas heat was satisfactory. The cause for any dissatisfaction was given prompt attention and eliminated immediately. The consumers voicing dissatisfaction were called upon again within a few weeks to determine if further service could be rendered to improve the efficiency of the appliance.

At the expiration of the 1936-37 heating season we sold 17% of the trial contracts for all cash, 36% on one of our approved payment plans, or a total sale of 53%. Two per cent of the contracts were left on additional trial where certain conditions war-

ranted an extension for several months; the balance, or 45%, were repossessed.

The repossessed appliances, with the exception of a small minority, were in excellent condition; this fact plus a purchase price increase in the appliances themselves, warranted the present selling price to remain the same as a year ago. Incidentally approximately 40% of the repossessed appliances have since been sold as of November 20, 1937, at the original selling price offered on the trial plan. We expect to sell the balance of the repossessed appliances on hand within the next year.

Cost of Plan

After taking into consideration the cash sales consummated and the amount involved in the customers' contracts on our books that is estimated will be returned to the company through the monthly appliance payments, the net promotional cost for the Trial Period Merchandise Plan amounted to approximately \$1.98 per consumer. This figure was obtained by dividing the total net promotional cost by the average of the entire number of consumers of all classifications on our lines for the fiscal year ending September 30, 1937. The cost includes all advertising, commissions, wages, drayage, installation loss on repossessed appliances and miscellaneous expenses.

The direct results and advantages that our company derived for the most part from the trial plan were:

- (a) 6% increase in service connections during the heating season.
- (b) 8% increase in average number of meters during the heating season.
- (c) 21% increase in gross sales over the preceding heating season.

NOTE: The average mean temperature was approximately 3° F. less per month during the trial period than for the previous heating season.

The indirect advantages brought about largely by the trial plan were: The benefits accruing to an educational heating campaign as a future load builder, advertising, that in addition to establishing better relations between the company and the local newspapers, clearly portrayed the advantages of gas heat.

There also developed a keener sense of cooperation and appreciation between the public and our company brought about by the realization that we, as a company, who were already sold on the idea of gas heating, were willing to assume the risks, responsibilities and expenses involved, to prove a point—the advantage of gas as a heating fuel.

The Science of Petroleum

IN January, 1938 the Oxford University Press will publish in four volumes of about 700 pages each, after many years of preparation, a comprehensive treatise with the above title on the principles and practice of the production and refining of mineral oil. The preface is by Walter C. Teagle, Chairman of the Board of the Standard Oil Company of New Jersey.

Air Conditioning Show Opens Jan. 24

HUNDREDS of operating exhibits will demonstrate man's conquest over the weather at the Fifth International Heating and Ventilating Exposition to be held at Grand Central Palace, New York, during the week of January 24 to 28, 1938. This presentation, otherwise known as the Air Conditioning Exposition, will offer a comprehensive preview of the systems and equipment for winter heating, ventilating and for air conditioning the year 'round.

Occupying three entire floors of Grand Central Palace, more than 300 companies will exhibit their latest equipment including boilers, burners, warm air furnaces, stokers, vapor and hot water heating systems, pumps, fans, blowers, unit heaters, space heaters, district heating accessories, thermal insulation, instruments and control appliances, electrical equipment, air conditioning and refrigeration machinery.

Gas Companies Merge

FINAL details of a merger between Coast Counties Gas and Electric Company and Natural Gas Corporation of California have been completed and approval granted by stockholders and the California Railroad Commission. Both companies are subsidiaries of Pacific Public Service Company.

Natural Gas Corporation owned and operated butane or natural gas plants in Arcata, Avenal, Brawley, Calexico, Dunsuir, El Centro, Fellows, Ford City, Kettleman City, Maricopa, Taft and Yreka. Butane-air plants in Rio Vista, Suisun-Fairfield, Vacaville and Isleton were sold to Pacific Gas and Electric Company prior to the merger. Pacific Gas and Electric Company will close these plants and substitute therefor natural gas from the new Rio Vista field.



Two views of the new industrial display room opened December 1 by the Consolidated Edison Company of New York in the company's main office building. The front section of the showroom, left, displays gas and electric counter equipment and heat treating and melting furnaces. The other view shows on the left gas cooking ranges for use in hotels and restaurants. In the center background is an automatic gas water heater, and in the right background is a row of heating ovens.

The Mystery Chef's Mailbag

I am one of your young ardent fans and enjoy your program so much. Mother has your cook book "Be an Artist at the Gas Range" and we children and the grown folks find every recipe as tempting and delicious as they sound.—Miss G. B., Burdett, N. Y.

For a long time I wanted to write you a line to thank you for all the help you have given me. Your little book from the gas company is the best cook book I ever had. Thanks to you and the gas company for it.—Mrs. A. J., Bronx, N. Y.

It is a pleasure and I think a duty we all owe to write you how much help your notes on cooking are to everyone. I have followed you ever since you first went on the air. I have all your books. I have seven in my family and I do all my own cooking, even the bread, and everyone enjoys eating at my house. I have made myself famous with your Scotch Broth.—Mrs. B. W., Springfield, Mass.

First you'll never know how much help you have been to me in giving my husband meals he simply loves. His mother is a grand cook and I don't mind telling you I was quite afraid that I wouldn't be able to give him the things he had been used to before he got married. We've been married almost four years although I'm only twenty-two. My husband doesn't make very much so we've had to be very economical not only in clothes but food too. I have your perfectly marvelous little book. It has helped me so much.—Mrs. J. L., Jr., Storrs, Conn.

Mother and I enjoy your wonderful radio programs, especially the recipes and advice you give. We have tried several of your recipes and have always had perfect results from them. We started to listen to you last December and both agree that we sure were missing something on the radio before we discovered your program.—Mrs. E. E. K., Gervais, Oregon.

We, sister and I, have enjoyed your programs so much: and have learned much about cooking (even if we are over 70). I have both of your cook books and have given many to younger sisters starting in home keeping. They help a great deal. Good cooked food makes for a happy home. I cannot tell you how much good you have given me in so many ways.—Mrs. S. H., Johnstown, N. Y.

Seventy-eight companies having in service 5,772,722 meters are participating in The Mystery Chef radio program. The companies are located in Connecticut, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, California, Oregon, Utah and Washington. The facilities of the following NBC stations are used to broadcast the program: WEAf, New York; WNAC, Boston; WTIC, Hartford; WJAR, Providence; WTAG, Worcester; WCSH, Portland; KYW, Philadelphia; WFBR, Baltimore; WGY, Schenectady; WBEN, Buffalo; WTAM, Cleveland; WHAM, Rochester; KDYL, Salt Lake City; KFI, Los Angeles; KGW, Portland; KOMO, Seattle; KHQ, Spokane.

A new feature of the program is the offer to listeners of a pamphlet containing twenty-seven new recipes of the Chef. In the two years that the program has been on the air more than 1,700,000 copies of the recipe book "Be an Artist at the Gas Range" have been called for in person at the offices of participating companies.

This is just to bring to you my word of sincere appreciation and thanks for your splendid cook book. I have just made a true sponge cake and I am thrilled for it looks just as you said it should. I enjoy your radio talks too, very much.—Mrs. J. E. B., Lemon Grove, Calif.

I want to let you know it was through your talks I have just bought a beautiful new gas range from the Southern Counties Gas Company here in Whittier. I have always used gas, but electric ranges had almost won me over, but your experiences with gas have convinced me that it cannot be improved upon. I hope you keep up the good work.—Mrs. H. C., Whittier, Calif.

Thanks to your wonderful cook book, "Be an Artist at the Gas Range," my cooking far surpasses that of an ordinary bride of eleven months who had practically no cooking experience before marriage. My husband often says that if he had known what a good cook I was he would have married me two years sooner, but I'm afraid he would have been disappointed because I didn't have your book then, but I did have a very good can opener.—Mrs. A. N., East Dedham, Mass.

Last Fall I had the choice of a new stove, either electric or gas. After hearing what you had to say about fuel, I, too, decided there was nothing to beat gas, so obtained a triple service range from my gas company in Thompsonville, Conn., and it's just jolly to work with. I would not want to change it for any stove on the market, by jove, as it certainly has been a wonderful investment, and a great comfort. Thanking you again for your help and I shall continue to listen in on your broadcasts.—Mrs. F. S., Windser, Conn.

This Spring I had an attack of flu, leaving me with no appetite whatever; tonics were no help. I was miserable. Listening in one morning to your delightful talk on the radio, I was loathe to have you say "good bye." So I got out my "Be an Artist at the Gas Range." In going over the different recipes I became hungry for old-fashioned food glorified by your way of cooking, and from that time on I grew an appetite. I'm a nurse, so watch me play your art on my "Not Hungry" patients. I think your cook book the finest ever and I thank you sincerely for helping humanity to live better by the right preparation of food.—Miss N. C. J., Los Angeles, Calif.

Words cannot express the invaluable aid your wonderful book "Be an Artist at the Gas Range" has been to one who was a complete "greenhorn" in that art. I call it my Kitchen Bible. Thank you from the bottom of my heart for your helping me to transform myself. I owe you a debt of gratitude, greater than words can express.—Mrs. M. C. B., Rockville Centre, N. Y.

I am one lucky Canadian Woman who possesses your valuable book, "Be an Artist at the Gas Range." My married sister after some difficulty secured one for me. I wish you could hear the shouts of praise I receive each time I make one of your grand pies or cakes. I cannot thank you enough for putting out such a wonderful book.—Mrs. R. P., Hamilton, Ontario.

My mother gave me a copy of your "Be an Artist at the Gas Range," when I was married and believe me it has saved many a meal for me. I don't think I could get along without it. It's the only cook book I've seen that tells how to boil peas, string beans, etc., and I didn't even know that when I got married.—Mrs. W. C. R., New Brunswick, N. J.

Never have I had a failure with one of your recipes, although I am only a novice at the art of cooking. I became a cook at a moment's notice when my mother was suddenly taken to the hospital. During her three months there, I managed to save many a meal from absolute failure by inserting one of the few recipes I had gathered from your radio broadcasts into the menu.—Miss M. A. C., Utica, N. Y.

I know you have letters from hundreds of people but I must add my thanks. I had to go 160 miles to get your cook book but it sure is worth it. Well now I know I just couldn't get along without it and now that a supplement is coming out I guess I must make another trip.

Thank you for the perfect cook book. It is such a relief to try a new recipe and know it's going to be good. Your "Be an Artist at the Gas Range" makes the perfect gift.—Mrs. G. Q., Wenatchee, Wash.

Your cook book, "Be an Artist at the Gas Range," has been in our home about ten days and is already dog-eared from

use. What a lucky accident for me when I first heard you broadcasting. I think, on second thought, that it must have been a design of the gods, for I was practically desperate about food when I chanced to hear you. The combination of a limited meat budget, a husband particular about his meat dishes, and being in an awful rut of sameness of meat dishes, was getting me down. I hastened to get your cook book after hearing half of one broadcast, and what it hasn't done for us!

In the first place it has cut our meat bill down one third, while miraculously giving us heartier dinners at the same time. In the second place it has enabled us to entertain more, as the cost of entertaining at dinners, formerly prohibitive, is no longer so. Thirdly, for the first time since I started housekeeping four years ago, our guests praise my meat and fish dinners and demand the recipes. My husband has become kitchen-minded and we fight for the privilege of preparing your dishes. He is now enthusiastic about dinners instead of patiently bored by most of them.

I have sent a great many friends, particularly newlyweds to our local gas company for your book. I wanted to send

this hymn of gratitude to you for the rejuvenation of culinary life in our home.—Mrs. W. L. R., Cambridge, Mass.

Have just obtained your cook book for myself and have no words to tell you how much I appreciate it. Every recipe I have tried so far has given me delightful success. Really, I did not believe green beans could be cooked in ten minutes until I tried your method and must say that I never dreamed they could be so delicious.—Miss B. G., Long Beach, Calif.

I first want to thank you for the wonderful and delicious recipes that you have given me over the air. As you say in your broadcasts ordinary eating is turned into delicious and appetizing meals. Every time I make an extra delicious meal my husband asks me if it is "Mystery Chef."

I have also gained a reputation for my cakes. Everyone wants me to make cakes for their special occasions, also church affairs. This was started when I made an orange cake from your recipe which you gave over the air.—Mrs. F. H. C., Toronto.

BELIEVE ME! BY RADIO'S FAMOUS MYSTERY CHEF

TO KEEP THE CREAM PITCHER FROM DRIPPING... SPREAD A TINY DAB OF BUTTER ON THE TIP OF THE SPOUT

WITH THE NEW GAS RANGES CAKES BAKE EVENLY ON EITHER THE HIGH OR LOW SHELF OF THE OVEN. SEE THEM AT YOUR RANGE DEALER'S AND FIND OUT ABOUT LOW PRICES!

YOU GET YOUR MONEY BACK QUICK WITH A MODERN GAS RANGE. NEW STYLE BURNERS SAVE FUEL. MEALS ARE COOKED BETTER AND IN LESS TIME

TO CUT BREAD THIN FOR PARTY SANDWICHES HEAT BLADE OF KNIFE IN BOILING WATER AND DRY. CUT WITH HOT BLADE!

Seeing is Believing!

Folks rave about the modern gas ranges! Why not? You'll know why the instant you set eyes on one of these gleaming beauties! For here's the very tops in cooking. Smart design...insulated ovens with automatic time and heat control. Broilers that broil quickly without smell or smoke or spatter. Burners that light themselves and give any amount of heat you need—from a gentle simmer to a quick boil for the early A. M. coffee! That all? Of course not! But come and see for yourself. And don't forget to peek at the price tags, they're shockingly low. At your dealer's or our nearest showroom. If you haven't a Mystery Chef cook book get one from our nearest office.

NEW YORK POWER AND LIGHT NIAGARA HUDSON

A recent advertisement tying up with The Mystery Chef program

I am a housewife 45 years old. I have never been able to make a pie crust in my life no matter how many recipes I had. Last Fall my husband gave me a new gas range and since I have it I have cut my gas bills more than half. I cook everything now from your cook book. And what I must tell you is my husband is a baker. A few days ago I made an apple pie from your book and to my surprise my pie was praised by everyone. Even my husband said he could not beat it. And of course I was very happy, but I must thank you many times for the praise I won from your wonderful book and talks on the radio. Sunday I made an elderberry pie with wonderful success. I am so happy I feel like a young bride just starting housekeeping.—Mrs. P. R. K., Neptune, N. J.

Seven years ago I had to stop my regular occupation as an electrician, due to a very tender skin condition, which became gradually worse for two years so that I became totally disabled. Since that time I have been slowly improving, due to a very rigid diet and an improved mental condition. You can imagine what a great help your programs and cook book have been. You see, my wife has been the wage earner. I can take care of the meals and we often have guests who always enjoy our menus. Incidentally, you always get a lot of the praise, and deservedly because of your explicit cook book. Our family and friends hope you long continue your excellent talks.—Mr. W. B. H., Woodhaven, Long Island, N. Y.

Gas Men See "World's Most Intricate Furnace"

BY combining the visual impressions secured from factory inspections with verbal impressions created by discussions led by factory officials, members of the Industrial Division of the New England Gas Association, at their December meeting got genuine first-hand information on one entirely new heat-treating process and on advanced practices in several standard heating operations.

Three well known works in Worcester, Mass., were visited. These were the Spring Mill and the Central Works of American Steel & Wire Company, and the Goddard Works of Wickwire Spencer Steel Company. The luncheon and meeting at which the technical discussions took place were held at Hotel Bancroft.

Gas Radiant Tubes Used

At the Spring Mill one of the most elaborate and interesting industrial furnaces ever built was inspected. This furnace has been developed for the first commercial venture in "Austempering" the new and exacting heat-treating process developed by Bain & Davenport of the U. S. Steel Corporation laboratories. It is doubtful if this process could have been successfully launched commercially except that gas radiant tubes and prepared atmospheres had previously been perfected and were available to the pioneer developers of "Austempering."

Continuous gas hardening, tempering and tinning furnaces for wire were inspected at all three plants. Wire with a wide range of physical characteristics, particularly spring wire, was observed in production.

Plant officials took charge of the two round-table discussions. Elmer E. Legge, of American Steel & Wire Company, described the metallurgy of "Austempering" and answered with great skill the many questions raised by those present.

R. S. Worth of Wickwire Spencer Steel Company led the discussion on tinning. During this discussion the many

points that affect the selection of a heating medium, besides cost and control, that are considered important to owners and operators were analyzed.

The meeting was presided over by Roy E. Wright of Cambridge, Mass., chairman of the Industrial Division of the New England Gas Association, and the plant inspections were arranged by the indus-

trial department of the Worcester Gas Light Company.

During the meeting the following nominations for officers of the Division for 1938 were made by a committee headed by Philip A. Nelles, Jr., of Boston: Robert M. Keeney, Hartford, Conn., for Chairman; Cecil C. Ogren, Boston, Mass., for Vice-Chairman; and Ralph B. Hawkins, Bridgeport, Conn., for Secretary. Six directors were also nominated.

Closing remarks at the meeting were made by Eugene D. Milener, Secretary, Industrial Gas Section, American Gas Association.

Toronto Gas Sales Increase

(From the annual report of the vice-president and general manager, Edward J. Tucker, to the shareholders of the Consumers' Gas Company of Toronto, November 8, 1937.)



E. J. Tucker

SPEAKING of the gas industry as a whole, while it is true that gas as a fuel is now faced with greater competitive conditions than ever before, it can be stated that the industry is in a very sound condition and well organized and equipped to meet the competition of-

fered.

Programs of research, national advertising and national selling campaigns, are being sponsored by the gas industry in Great Britain, United States and Canada with excellent results.

The national advertising campaign, inaugurated last year by the American Gas Association, in cooperation with appliance manufacturers, will be continued for a second year and contemplates a further expenditure of \$500,000 on display advertising.

The wisdom of supporting research work into technical problems relating to the man-

ufacture, distribution and utilization of gas will be recognized by everyone.

In recent years gas burning appliances have been very much improved both in appearance and in operating efficiency. New gas ranges require considerably less gas for the same cooking operations than the old models they replace and in this respect do not contribute to an increase in the use of gas. However, the operation of these more efficient ranges materially strengthens the competitive position of the industry.

Even better and more efficient ranges will be available shortly. Working in cooperation, the American Gas Association and the Association of Gas Appliance Manufacturers, have adopted new and higher standards of performance for gas ranges.

Early in 1938 ranges capable of complying with the standards adopted will be manufactured and placed on the market.

So far as our own company is concerned it has been its policy for many years to prosecute an active and progressive sales policy.

Sales of gas burning appliances last year were 22 per cent ahead of the previous year and 84 per cent ahead of the sales of 1934. The efforts of our sales department are supported by a program of well prepared advertising, as well as by the activities of the home service department.

Gas Executives in Conference



King Photo

A jovial moment at the President's Dinner in New York, November 22. Left to right: J. V. Postles, K. R. Boyes, Thomas R. Weymouth, R. M. Conner, R. W. Hendee, E. H. Poe, W. C. Beckjord, President N. C. McGowan, Alexander Forward

Central Heating Installations Gain

RESULTS of the tenth annual survey of gas-fired central space heating installations in the United States and Canada, conducted by the Association's statistical department, show a substantial gain in number of gas installations connected to the lines of 268 companies between July 1, 1936 and July 1, 1937. A summary of the results is presented below. *It should be noted that the present survey is confined entirely to the types of central heating installations reported by these 268 companies.*

It is estimated that the total number of gas central house heating installations connected to the lines of all United States gas companies in 1937 amounted to 735,000. In addition there were approximately 1,300,000 dwellings heated by unit heaters, space heaters, floor furnaces, etc., giving a total of more than 2,000,000 homes in the United States that are heated by gas.

The total number of central house heating installations reported by the 268 manufactured and natural gas companies included in this survey was 246,782 on July 1, 1937. This was an increase of 44,741, or 22.1% as compared with July 1, 1936. Installations in manufactured and mixed gas territory showed a pronounced gain for the year, amounting to 19.7%, while natural gas installations registered an increase of 23.3%.

Manufactured and Mixed Gas

Complete reports from 171 manufactured and mixed gas companies serving 8,073,280 customers, or approximately 83% of the total manufactured gas customers in the country, indicate that these companies had 78,563 central heating installations connected to their lines on July 1, 1937, an increase of 12,950 or 19.7% over July 1, 1936. During the twelve months ending July 1, 1937, these companies sold 29,015,513,000 cubic feet of manufactured and mixed gas for house heating, an increase of 8% over the previous twelve months.

The most pronounced increase during the year was registered in conversion burner installations which gained 7,810 or 25.2%. The increase in gas-designed jobs was only 14.8%. On July 1, 1936, gas-designed jobs constituted 52.9% of the total installations reported, but on July 1, 1937, this percentage had fallen to 50.7%.

Twenty-five companies showed losses in the total number of house heating customers served. The industry as a whole, however, registered a pronounced gain due to substantial increases on the part of some companies. The largest increase was reported by the Washington Gas Light Company, which recorded a gain of 3,201 installations, an increase of 37%. Substantial increases in installations were also reported by the following companies:

Brooklyn Union Gas Company
Consolidated Edison Co. of N. Y., Inc.
Public Service Electric & Gas Company
Minneapolis Gas Light Company
St. Louis County Gas Company
Republic Light, Heat & Power Co.
Public Service Co. of Northern Illinois
Seattle Gas Company
New York State Electric & Gas Corp.
Philadelphia Gas Works Co., The
Washington Gas Light Co. of Montgomery Co.
Long Island Lighting Company
Central New York Power Corp.
Des Moines Gas Company
Boston Consolidated Gas Co.
Rochester Gas & Electric Corp.
North Shore Gas Company
Peoples Gas Light & Coke Co.
Southern Indiana Gas & Electric Co.
Kings County Lighting Company

For the 171 manufactured and mixed gas companies as a group, house heating customers were 1.0% of total gas customers. However, at least 27 companies reported a house heating saturation in excess of 2%. These companies are as follows:

Company	Saturation Per Cent
Iowa Central Utilities Co.	12.3
Washington Gas Light Co. of Montgomery Co.	9.8
Washington Gas Light Co.	8.3

St. Louis County Gas Company	7.6
Owego Gas Corporation	7.4
Marion Gas Company	7.2
New York State Elec. & Gas Corp.	6.3
Public Service Co. of No. Ill.	5.9
Georgia Power Company	5.9
Des Moines Gas Company	4.8
Western United Gas & Electric Co.	4.6
Seattle Gas Company	4.4
Central Illinois Public Service Co.	4.2
Southern Indiana Gas & Elec. Co.	3.9
Republic Light, Heat & Power Co.	3.5
Metropolitan Utilities District of Omaha	2.7
Consolidated Gas, Electric Light & Power Co. of Baltimore	2.6
Puget Sound Power & Light Co.	2.6
North Shore Gas Company	2.4
Haverhill Gas Light Company	2.4
Concord Gas Company	2.4
Lakeshore Gas Company	2.2
Minneapolis Gas Light Company	2.1
Birmingham Gas Company	2.1
Central New York Power Corp.	2.1
Blackstone Valley Gas & Elec. Co.	2.0
Roslyn Gas Company	2.0

Natural Gas

Complete reports from 97 natural gas companies serving 2,511,772 customers or approximately 37% of the total natural gas customers of the country showed that these companies had 168,219 central heating installations connected to their lines on July 1, 1937, an increase of 31,791 or 23.3% as compared with the preceding year. During the year ending July 1, 1937 these companies sold 22,745,935,000 cubic feet of gas for central house heating, an increase of 28.3% over the previous twelve months.

Very few reports were received from some of the important states where natural gas has been available for many years and in which thousands of homes are heated by gas.

A few natural gas companies reported slight decreases in installations served, but most of the companies reported satisfactory increases. The companies showing a drop in installations were generally those with a very slight degree of saturation.

Large increase in house heating installations were reported by the following natural gas companies:

Pacific Gas and Electric Company
 Detroit City Gas Company
 Consumers Power Company
 Grand Rapids Gas Light Company
 Gas Service Company (Kansas)
 Atlanta Gas Light Company
 Kansas City Gas Company
 Public Service Co. of Colorado
 Equitable Gas Company
 Iowa-Nebraska Light & Power Company
 Dayton Power & Light Co., The
 Central Illinois Light Company
 Manufacturers Light & Heat Co., The
 Hope Natural Gas Company, The

The average saturation of all reporting natural gas companies was 6.70% on July 1, 1937, as compared with 5.66% on July 1, 1936. These figures would undoubtedly be considerably higher if reports had been received from several of the larger

companies which have been distributing natural gas for a number of years.

Trends in Equipment Installed

The manufactured and natural gas companies reported increases in all types of equipment—gas-designed and conversion jobs, boilers and furnaces. However, conversion burner installations showed a larger percentage increase than did straight gas-designed jobs.

In manufactured gas territory gas-designed installations were 50.7% of the total installations on July 1, 1937. In natural gas territory, gas-designed installations were 54.8% of the total on July 1, 1937.

Building Heating

Complete reports from 99 manufactured gas companies indicated 4,073 building heating installations connected to their lines as of July 1, 1937, an increase of 1,030 or 33.8% over the previous year. Gas sold to these installations during the twelve months ending July 1, 1937 amounted to 1,832,912,000 cubic feet, an increase of 19.2% from the preceding twelve months. Many manufactured gas companies having only a few building heating installations included such jobs under house heating in their reports.

Complete reports from 87 natural gas companies indicate they were serving 12,004 building heating installations on July 1, 1937, an increase of 1,292 or 12.1% over July 1, 1936. During the year ending July 1, 1937, 17,229,671,000 cubic feet were sold for building heating, an increase of 11.7% over the previous year. Pacific Gas & Electric Co., reported an increase of 11.7% in building heating installations, the number served increasing from 3,763 on July 1, 1936 to 4,205 on July 1, 1937.

(Copies of the complete report are available at Association headquarters.)

"Mr. Therm" Is Gas Industry's Rival of Mickey Mouse

FROM the magazine, *Business Week*, November 6, 1937, comes the information that Mr. Therm, a benign little man with a round face, a smile and a body of flame, is giving Mickey Mouse some competition in London theaters. He is a person created by the Gas Light and Coke Company to dramatize gas services in the company's advertisements. At present he is appearing in a series of industrial film shorts in which his creators have carried out their job so well they are beginning to receive substantial bookings for each new Mr. Therm picture as it is released. The following is quoted from *Business Week*.

"It is generally accepted in London that the sales development work of the gas industry is better than that of electricity and most other industries.

"The gas industry was the first to set up a cooperative sales development association of all the principal gas undertakings in the country (the British Commercial Gas Association). The biggest producer—Gas Light & Coke Co., which supplies most of London—has also carried out its own programs.

The Birth of Mr. Therm

"Mr. Therm was created several years ago when the industry decided to measure and charge for gas supplied not according to volume but according to heat units con-

tained. 'Therm' was coined as the name for these units, and the industry's public relations department set to work to educate the public to appreciate the new plan. Success was assured when Mr. Therm was created as a living personality. His antics are so popular that commercial theaters book his films as a short feature.



"Mr. Therm" as he appears in newspaper copy

"The gas industry has not closely confined its films to propaganda for the industry. Each year the Gas Light & Coke Co. does one film of national educational interest more or less unconnected with gas. Last year the subject chosen was health. This year the choice was education, and the emphasis is on the large number of secondary schools in which the teaching conditions are

bad because of noise, outmoded buildings, etc. It was also declared that dictator countries have realized the importance of educating youth, and if democracies are to survive they must do the same.

"Most recent shorts dealing specifically with gas include a film of wide public interest in which X. Marcel Boulestin, proprietor of what is generally considered the best restaurant in London, discussed cooking and carried on his demonstrations on a gas stove. Another film was on Kensal House, the block of apartments erected by the company to show how its fuel should be used in rehousing slum workers."

Gas Evidently Preferred

TO "The Metrogram" (staff journal of the Metropolitan Gas Co., Melbourne, Australia) we are indebted for the following figures showing the large share of the business gas is getting from new buildings erected in the company's area of supply.

The period covered by the following table is six months ended 30th June last. The number of new buildings is 1,541.

	Stoves	Hot Water Services	Bath Heaters	Wash Coppers
Gas	1,526	719	481	1,271
Electricity	12	130	—	—
Fuel	151	120	55	211

Might we say to those who operate our subsidiary gas companies that these are useful figures with which to arm your salesmen, because although conditions in Melbourne might be very different from your own, electricity is cheap in Melbourne, and the electrical trade is aggressive, though the figures do not convey that impression. The aggression would seem to be all on the side of gas.—*The C. G. A. Service Messenger*.

Personal and Otherwise

A.S.A. Re-elects Dana Barnum; W. J. Serrill Retires



D. D. Barnum



W. J. Serrill

DANA D. BARNUM, past president of the American Gas Association and former president for many years of the Boston Consolidated Gas Company, was re-elected president of the American Standards Association, December 1 at the association's annual meeting in New York City. Mr. Barnum has served on the Board of the A.S.A. since 1933.

R. B. Harper, vice-president of The Peoples Gas Light and Coke Company, Chicago, was appointed new representative for the manufactured gas industry on the Standards Council, succeeding W. J. Serrill, The United Gas Improvement Co., Philadelphia, who resigned after twelve years on the council. Thomas R. Weymouth, vice-president, Columbia Gas & Electric Corp., Pittsburgh, is representative for the natural gas industry on the Standards Council. H. D. Hancock, Cities Service Company, New York, is alternate.

In his annual address Mr. Barnum stressed the new work aimed at consumer goods standards and reported the largest increase in membership of any year since the association was formed nineteen years ago. Sixteen new national groups joined the A.S.A. during the year. Fifty-nine standards were approved in the course of the year. This brings the total number of standards approved to 382, since the association was organized in 1918 to act as a clearing house for the many standardization activities of trade associations, technical societies and government bureaus in this country.

Mr. Barnum emphasized the opportunity of the American Standards Association to perform a real service in the housing field. By removing unduly restrictive regulations and opening the way for the use of new materials and methods, he felt that the association could do its bit toward the solution of this great problem.

In retiring as representative on the Standards Council, Mr. Serrill brings to

a close a long period of distinguished service. He became a member of the Standards Council on November 10, 1925. He was appointed chairman of the Main Committee, American Engineering Standards Committee (predecessor of the American Standards Association) in April, 1928. In October, 1928, he became president of the newly organized American Standards Association, at the same time holding the office of chairman of the Standards Council, which replaced the old Main Committee of the A.E.S.C.

Mr. Serrill served as president of the A.S.A. and chairman of the council until the end of 1930 when he was succeeded by Bancroft Gherardi, of the American Telephone and Telegraph Co., as president and C. M. Chapman as chairman of the council.

Mr. Serrill continues as representative of the American Gas Association on the Standards Council until December 31, 1937.

Donald A. Henry Heads Rate Committee



Donald A. Henry

President N. C. McGowen of the American Gas Association has appointed Donald A. Henry, chairman of the Rate Structure Committee. Mr. Henry is eminently qualified by training and experience to head this important committee.

Educated in the University of Illinois in engineering and the Lincoln College of Law, he received graduate and professional degrees in 1909 and 1919. After five years spent in practical engineering work, Mr. Henry joined the staff of the Illinois Commission, then known as the State Public Utilities Commission of Illinois, in 1914 and was a member of its engineering staff for twelve years.

Leaving the Commission he joined the staff of Utilities Management Corporation, the management organization of Utilities Power and Light Corporation in 1927, with the title of rate and valuation engineer and in 1928 held a similar position with the Central Public Service Corporation.

Mr. Henry became a member of the

Rate Structure Committee of the American Gas Association in 1929, has taken an active part in its work, and contributed a number of studies included in the reports of the committee.

In 1933 he joined the staff of Stone & Webster Service Corporation as rate engineer. His present duties consist of supervision of rates of gas, electric, water and heat utilities, under the supervisory control of Stone & Webster Service Corporation, operating in 37 states and several foreign countries. The gas properties include both manufactured and natural gas and some butane-air plants.

L. B. Denning Again Heads Dallas Chamber

L. B. DENNING, president of the Lone Star Gas Company, Dallas, Texas, and past president of the American Gas Association, was re-elected president of the Dallas Chamber of Commerce at a meeting of the directors, December 10. Re-election of Mr. Denning follows his leadership during one of the Chamber's most successful years. At the annual meeting, December 7, fourteen hundred citizens of Dallas attended, which was double the attendance of any previous meeting in the Chamber's history.

Consolidated Edison Gas Veterans Retire

FOUR men well known in the gas industry by virtue of their many years of service in the Consolidated Edison Company of New York and its predecessor companies, have recently retired. They are Frank R. Barnitz, George W. Parkhurst, Cornelius M. Carbonell, and Wilder F. Lawrence.

Mr. Barnitz, who was president of the Northern Union and Central Union Gas Companies until their merger into Consolidated Edison last year, retired early in November after forty-five years of service. He started as a junior clerk in the Hester Street office and earned many promotions until he became assistant superintendent of the district office at 2084 Third Avenue.

He became general superintendent of the gas commercial department in 1905, in charge of district offices. Later gas appliance, hotel and restaurant, industrial and meter divisions came under his supervision. He became assistant secretary of Consolidated Edison in 1913, and in 1924 the duties of general commercial manager were added.

Mr. Parkhurst, assistant secretary, Consolidated Edison, retires December 1 with a service record of forty-three years; he held many important executive posts in the System gas companies.

Mr. Carbonell retired on November 1 with almost a half century of service. He started as a stenographer in 1888 and later became secretary to President Gawtry. When he retired he was assistant secretary of Consolidated Edison.

Mr. Lawrence, general superintendent, Astoria Gas Plant, retired November 1 with a service record of forty-eight years. He started as general manager of the Queens Gas Company and in 1901 transferred to New Amsterdam Gas as assistant manager. Next year he went to Ravenswood Plant where later he became superintendent. Then he went to Astoria in the same capacity, and subsequently became general superintendent.

Dr. Harvey Davis Elected A. S. M. E. President

DR. HARVEY N. DAVIS, president of Stevens Institute of Technology, Hoboken, N. J., was elected head of the American Society of Mechanical Engineers at the fifty-eighth annual meeting of the society. Dr. Davis succeeds James H. Herron, president of the James H. Herron Company of Cleveland.

Dr. Davis has been a member of the society since 1920. In 1929, he was appointed a member of the council. In the last year he has acted as chairman of meetings and as a member of the advisory board of technology.

Henry L. Doherty Receives Petroleum Medal



Henry L. Doherty

HENRY L. DOHERTY, president of the Cities Service Company, has received the Anthony F. Lucas Gold Medal for distinguished achievement in improving the practice of finding and producing petroleum, it was announced November 25 by the American Institute of Mining and Metallurgical Engineers.

The award was made on the recommendation of a special committee of fifteen members of the petroleum industry, with John R. Suman, vice-president of the Humble Oil Company, as chairman. The medal has been awarded on only one previous occasion, when the recipient was J. Edgar Pew, vice-president of the Sun Oil Company.

Mr. Doherty's contribution to petroleum production was his recognition of the importance of gas dissolved in oil in the pool and the relation of this element to the viscosity of the fluid and its flow to the wells.

Experimental apparatus was constructed

under Mr. Doherty's direction to test the relation of viscosity to gas content in oil. The results showed that the escape of gas from oil in the pool made the oil heavier, hampered its flow and caused a heavier proportion of the oil to remain in the sand.

It was learned that if sufficient pressure was kept on oil in the natural reservoir, the fluidity was maintained and oil could be caused to flow more freely to the wells from considerable distances. From these discoveries stemmed the "unit" operation of pools, now required by law in Mexico, Colombia and in the United States for the development of oil in Federal lands.

Mr. Doherty has been an advocate of a plan to recognize by law the unit nature of oil pools owned by various surface holders. The principle of unit operation has since been endorsed by the Federal Oil Conservation Board, the National Petroleum Institute and the American Institute of Mining and Metallurgical Engineers, which made the award.

In June, 1931, the honorary degree of Doctor of Engineering was presented to Mr. Doherty by Lehigh University "in recognition of his distinguished contribution to the art and science of gas, electric and petroleum production, distribution and utilization."

100 Years of Progress Celebrated



During the recent "100 Years of Progress" celebration, commemorating the incorporation of the first gas company in St. Louis, 1,200 gas ranges were sold in a ten-day period. Pictured here is Charles Heiss, manager of the Hotel Mayfair, presenting J. B. Wilson, president of The Laclede Gas Light Company with an elaborately decorated cake during the celebration. Left to right, are: Mr. Heiss, E. W. McKay, Mr. Wilson, H. F. Voertman, B. F. Pickard, vice-president and general manager, and E. L. White, secretary and treasurer

Seek Water, Get Natural Gas

ANTON MIEREK, 60-year-old farmer of the town of Western, N. Y., hired a crew to drill for water on his 380-acre farm. At 400 feet they struck a flow of natural gas, enough to heat and light his home and outbuildings and run his farm machinery. John M. Lewis, the driller, estimated the flow today at 500,000 cu.ft. daily.

McCarter Medal Winners

TWO employees of the Consolidated Edison Company of New York recently joined the gas industry's roll of honor for their achievements in life saving by the Schafer prone pressure method of resuscitation. These employees, Gerard Martin Beegan and William Dengler, were awarded McCarter medals and certificates for their outstanding acts of heroism.

The presentations took place during October. J. L. Lufkin, general superintendent, department of station construction and shops, presented the medal and certificate to Mr. Beegan on October 25. Mr. Dengler received his awards on October 15 from James R. Cox, superintendent of transportation.

The awards are made possible through the generosity of Thomas N. McCarter, president, Public Service Electric and Gas Company.



Sales floor of the Webster Groves office of The St. Louis County Gas Company and the Union Electric Company which has been modernized for display of gas and electric appliances. A new decorative note in the treatment of the lower portion of the walls has been effectively carried out—that of Jasper linoleum—marine blue harmoniously combined with terra cotta and delicate peach

One Man Is Whole Works

A GAS works run by the smallest staff of any in Great Britain is claimed by Goudhurst, England, a Kent village of nearly 3,000 people. For the Goudhurst gas works are run by just one man. Arthur Fisher is this modern Pooh-bah.

No unsightly gasometer is allowed to blot out the sky, for the gas works, founded nearly 70 years ago, are buried away just off the road and surrounded by old cottages and woods.

Mr. Fisher starts his day in an advisory capacity. He has to determine how much gas the works must produce to keep the village supplied for the next 24 hours. He finds this is generally about 15,000 cu.ft.

Switching over from the executive side in real earnest, Mr. Fisher then proceeds to his duties as coal-heaver and coke-breaker. He shovels several tons of coal into the great ovens. When the gas has been drawn off and stored, the coke is broken up, washed and put into sacks for delivery.

Mr. Fisher then turns delivery man. He takes the sacks of coke round to the villagers on a little hand cart. Some of his customers live a mile away.

No subsidiary company is necessary to deal with the by-product, for Mr. Fisher manages these too. He sells about 3,000 gallons of tar during the year, much of which he delivers himself.

Upkeep and repair departments are also under the same direction. The little engine which drives the pump to circulate the gas to consumers has to be kept running night and day. If there is a breakdown customers send the news to Mr. Fisher, who cycles down to repair the offending engine. His home is three miles away.

The maintenance of the apparatus lent to customers also comes under his supervision—if a stove is not working or a gas mantle has been broken, Mr. Fisher cycles at once to effect the repair.

In addition to upkeep of the garden at the back of the works, where he grows tomatoes, Mr. Fisher fills in his "spare" time with oiling and repairing the machinery, keeping the plant in working order, answering inquiries and cleaning the yard.

—*Christian Science Monitor.*

Gas at Realtors' Meeting

THE gas industry was well represented at the annual convention of the New Jersey Association of Real Estate Boards, held December 2-4 at the Hotel Tray-

more, Atlantic City. An attractive exhibit of modern gas appliances, sponsored by the New Jersey Gas Association, was held in the main lobby of the hotel. On one side of the lobby the exhibit was devoted entirely to the use of gas for house heating while on the other side domestic uses, such as cooking, refrigeration, laundry drying, etc., were shown. The General Gas Light Company also had a booth at the exhibit.

The Public Service sound film, "The March of Gas," was presented as a part of the convention program. The film was introduced by K. I. Robinson, chairman of the Heating and Air Conditioning Committee of the New Jersey Gas Association, who was in general charge of the gas industry's participation in the convention.

J. P. Leinroth, president of the New Jersey Gas Association, in speaking of the exhibit, emphasized the importance of the roll of the realtor in the matter of installing modern gas appliances in old and new houses.

Approximately 400 were in attendance at the convention, including the outstanding realtors in the State.

16 Buildings at Fair to be Heated by Gas

ALL water heating, space heating and cooking will be exclusively by gas in all buildings operated by the fair corporation at the New York World's Fair, under the terms of a contract which the corporation has signed with The Brooklyn Union Gas Company.

Sixteen buildings already have been completed or are under construction which will be operated by the fair corporation. In all of these buildings gas will be used for heating and for supplying hot water. In the two buildings in which cooking will be done, the Administration Building and the World's Fair Club, gas will be used also for cooking.

The estimated hourly gas consumption is 105,000 cubic feet.



One side of the lobby exhibit at the New Jersey realtors' meeting showing gas house heating equipment. The other side was devoted to domestic gas appliances

Special A.S.A. Services to A. G. A. Members

BY special arrangement with the American Standards Association, all company members of the American Gas Association are entitled to certain services commonly enjoyed by company members of the A.S.A. The purpose of this arrangement is to enable members of the American Gas Association to keep in touch with developments in industrial standardization of interest to them.

One of these services entitles every company member of the American Gas Association to a free subscription to *Industrial Standardization*, published monthly, which keeps members of the A.S.A. in touch with standardization activities and developments both here and abroad.

A second service is free use of the A.S.A. Information Service and Reference Library of some 20,000 standards,

books, and related material. The A.S.A. is the authorized clearing-house for information about standards. It answers many thousands of questions a year, in addition to lending domestic and foreign specifications to members who sometimes need this information in filling an order or closing a bid.

Another A.S.A. service keeps A. G. A. members informed of newly published American Standards in which they may be interested. This is done by sending the notices about new standards that go out regularly to A.S.A. members to the members of the American Gas Association as well. Furthermore, A. G. A. companies are entitled to the regular 20 per cent membership discount on all purchases of standards.

On November 1st the American Standards Association sent a letter to company members of the American Gas Association explaining these services. If your

company did not receive a letter or has not yet arranged for services, we suggest your writing without delay to the American Standards Association, 29 West 39th St., New York, N. Y.

Pennsylvania Gas Association

THE thirtieth annual convention of the Pennsylvania Gas Association will be held at Sky Top Lodge, Sky Top, Pa., on May 3, 4 and 5, 1938. H. S. Christman, president, and the various officers and committeemen are busy planning an attractive program and a number of men prominent in the gas industry will be among the speakers.

Pacific Coast Advertising in 1938

THE cooperative advertising program conducted by the Pacific Coast Gas Association each year since 1929 will be continued during 1938 with an estimated expenditure of \$37,000. The purpose of this advertising is to keep gas and its uses constantly before Pacific Coast home makers and business groups, emphasizing local conditions conducive to the use of gas and keeping pace with improvement in appliances. It thus supplements the national advertising and individual company advertising.

Statistics Fresh from the Kitchen

GROWTH in sizes and sales of corporate bakeries has long been a sign of these convenience-loving times. That home baking is still practiced on a considerable scale is the suggestive revelation of a survey made in Fort Wayne, Ind., population 100,000, by Macfadden Publications. Although 79 per cent of the families bake at home, only eight per cent make their own bread. Biscuits ranked higher with a 49.5 per cent showing. How well pie is holding its own is indicated by its standing in the family baking list—94.5 per cent bake pies, 93 per cent bake cake, 74.2 bake cookies.

Jellies and jams are also a persistent product of home kitchens—66.3 per cent of the Fort Wayne families reported the practice of this domestic art. As for quantity, 40 per cent of the families put up more than 50 glasses of jelly and 42.3 per cent more than 30 jars of jam.—*Nation's Business*, December, 1937.

The gas industry has in the last few years been reborn with the experience of 120 years behind it.—G. DIXON, Nottingham, England.

Convention Calendar

JANUARY

- 17-18 **Compressed Gas Manufacturers Association**
Waldorf Astoria Hotel, New York, N. Y.
- 19 **National Bottled Gas Association**
Waldorf Astoria Hotel, New York, N. Y.
- 24-28 **International Heating & Ventilating Exposition**
Grand Central Palace, New York, N. Y.

FEBRUARY

- 3-4 **A. G. A. Eastern Natural Gas Regional Sales Conference**
William Penn Hotel, Pittsburgh, Pa.
- 10-12 **A. G. A. Mid-West Regional Gas Sales Conference**
Palmer House, Chicago, Ill.
- 14-18 **American Institute of Mining & Metallurgical Engineers**
Engineering Societies Bldg., New York, N. Y.
- 16-18 **Southern Gas Association and A. G. A. South-Southwestern Regional Gas Sales Conference**
Hotel Adolphus, Dallas, Texas
- 24-25 **New England Gas Association**
Hotel Statler, Boston, Mass.

MARCH

- 7-8 **A. G. A. National Conference on Industrial Gas Sales**
William Penn Hotel, Pittsburgh, Pa.

APRIL

- 4-6 **A. G. A. Distribution Conference**
Netherland Plaza, Cincinnati, Ohio
- 11-13 **Mid-West Gas Association**
St. Paul, Minn.
- 18-21 **American Chemical Society—Division of Gas & Fuel Chemistry**
Dallas, Texas
- 20-22 **Missouri Association of Public Utilities**
Jefferson Hotel, St. Louis, Mo.

MAY

- 2-5 **U. S. Chamber of Commerce**
Washington, D. C.
- 3-5 **Pennsylvania Gas Association**
Sky Top Lodge, Sky Top, Pa.
- 9-12 **A. G. A. Natural Gas Department**
Roosevelt Hotel, New Orleans, La.
- 14-21 **International Petroleum Exposition**
Tulsa, Okla.
- 23-24 **A. G. A. Commercial and Hotel & Restaurant Sales Conference**
New York, N. Y.
- 24-26 **A. G. A. Production & Chemical Conference**
Hotel Pennsylvania, New York, N. Y.

JUNE

- 9-10 **Canadian Gas Association**
Royal York Hotel, Toronto, Ontario
- 23-24 **New England Gas Association, Sales Conference**
Viking Hotel, Newport, R. I.
- June 28-July 1 **American Home Economics Association**
Hotel William Penn, Pittsburgh, Pa.

OCTOBER

- Wk. 10 **American Gas Association**
Atlantic City, N. J.
- National Metal Congress and Exposition**
★ Detroit, Mich.
- ★ Includes exhibit sponsored by A. G. A. Industrial Gas Section.

Accounting Section

D. H. Mitchell, Chairman

H. W. Hartman, Secretary

H. A. Ehrmann, Vice-Chairman

Budgeting Bills for House Heating Service

THE policy of budgeting bills for gas house heating service was adopted by Public Service Electric and Gas Company about two years ago. To date it has proved satisfactory. The budget plan of billing provides a convenient method of paying for this service and certain advantages accrue from it both to customers and to the company. At the present time approximately 25% of all house heating customers use the budget payment plan and there is every indication that this number will increase.

The procedure for handling budget accounts is outlined below.

Procedure

Public Service Electric and Gas Company has a Central Customers' Billing Department where the accounts of all customers are billed. All customers' accounting, however, is done in the twenty-seven branch offices located throughout the territory.

The company has a Residential Service Rate, which is available to customers for all residential purposes, including house heating. All budget customers are billed on this all-purpose rate.

Two meters are used for each customer

By S. S. ELLIS

Public Service Electric and Gas Company,
Newark, N. J.

who uses gas for house heating—one meter measures the gas used for heating and the other meter measures the gas used for other domestic purposes. This enables an accurate measure of the gas used for heating.

Residential customers who use gas service for house heating and other domestic purposes under the Residential Service Rate have the option of paying for their heating service in equal estimated monthly installments, beginning with the billing for the month of September and ending with the billing for the month of June.

Under this plan such customers, except new customers, are billed each month for ten months, for one-tenth of the total estimated cost of heating, based on the consumption during the previous heating season, adjusted to normal degree days.

A new customer is billed on the basis of an estimate of use for the months involved to close the account for the heating season with the billing for the month of June.

Any necessary adjustment between the budget amount and the actual amount is made with the July billing.

The use of gas for domestic purposes, other than house heating, is not budgeted but is billed each month in the regular way and is payable monthly.

Billing

A four-part bill form is used, consisting of the Ledger Record, Customer's Bill, Cashier's Coupon, and Representative's Coupon.

See Exhibit No. 1—Customer's Bill.

Customers whose heating accounts are budgeted are billed each month on the regular bill for all gas used for other than house heating. This billing is at the higher blocks of the Residential Service Rate.

The amount the customer has agreed to pay for house heating under the Budget Plan, and the total amount for all service, is shown on the Customer's Bill and on all coupons of the bill form.

The monthly Budget Plan amount shown here on the customer's bill is a memorandum charge only, so far as the company is concerned, and is not included in the report of gas sales. However, from the customer's

PUBLIC SERVICE ELECTRIC AND GAS COMPANY					
418 FEDERAL STREET, CAMDEN, N. J.					
OFFICE HOURS: 8 A. M. TO 5 P. M.					
SATURDAYS DURING JUNE, JULY AND AUG. 8 A. M. TO 12 M.					
ALL EMPLOYEES AUTHORIZED TO ENTER CUSTOMER'S PREMISES OR TO RECEIVE MONEY FOR THIS COMPANY WEAR BADGES OR CARRY IDENTIFICATION CARDS.					
<div> <div>IF YOU NEED SERVICE CALL CAMDEN 4300</div> <div> <div>SERVICE PERIOD</div> <div>JOHN DOE</div> <div>JAN 6 1937 TO FEB 3 1937</div> <div>28 DAYS</div> </div> <div> <div>100 NELSON ST., CAMDEN N. J.</div> <div>3-19-5</div> <div>G 468301</div> </div> </div>					
BILLS ARE PAYABLE UPON PRESENTATION. THIS BILL MAY BE PAID AT ANY DISTRICT OFFICE.					
CLASS OF SERVICE	METER READINGS		HUNDREDS CUB. FT. (KILOWATT HRS.)	RATE	AMOUNT
	PRESENT	PREVIOUS			
GAS	9264	9128	136	RSG	10.57
					15.00
					TOT 25.57
<div> <div>GAS BILL</div> <div>ELC. BILL</div> <div>POWER BILL</div> <div>TOTAL</div> </div> <div> <div>AMOUNT DUE</div> <div>TOTAL</div> </div>					
GAS BILL NUMBER OF GAS METER: _____ ELEC. BILL NUMBER OF GAS METER: _____ POWER BILL NUMBER OF GAS METER: _____ TOTAL AMOUNT DUE: _____ TOTAL: _____					
Our Home Service Department will gladly help you in your home management problems. Their assistance is free—it's a part of our endeavor to make our service to you convenient and economical.					

Exhibit 1—One part of four-part Customer's Bill

PUBLIC SERVICE ELECTRIC AND GAS COMPANY					
STATEMENT OF GAS USED FOR HOUSE HEATING					
BUDGET PLAN					
RATE RSG—RESIDENTIAL SERVICE					
<div> <div>THIS IS NOT A BILL</div> <div> <div>JOHN DOE</div> <div>100 NELSON ST., CAMDEN N. J.</div> <div>3-19-5</div> <div>H. G.</div> <div>G 237773</div> </div> </div>					
CLASS OF SERVICE	METER READINGS		HUNDREDS CUB. FT.	RATE	AMOUNT
	PRESENT	PREVIOUS			
GAS	6782	6294	488	RSG	24.40
THIS STATEMENT IS PREPARED IN ORDER THAT YOU MAY HAVE A COMPLETE RECORD OF YOUR GAS HOUSE HEATING ACCOUNT. THE AMOUNT SHOWN HEREON REPRESENTS YOUR ACTUAL USE OF SERVICE FOR GAS HOUSE HEATING FOR THE PERIOD INVOLVED. THE AMOUNT DUE AND PAYABLE FOR GAS HOUSE HEATING, UNDER THE TERMS OF THE BUDGET PLAN, IS SHOWN ON THE ATTACHED BILL.					

Exhibit 2—Statement of gas used for house heating (also in four parts)

point of view, the Budget Plan amount shown on the bill is the amount to be paid.

A "Statement of House Heating" is attached to the monthly bill of each customer served under the Residential Service Rate Budget Plan. This form is in four parts, similar to the Customer's Bill.

See Exhibit No. 2—Statement of House Heating.

The meter readings, consumption, and amount for the month, as actually measured by the house heating meter, is shown on the Ledger Record Copy and on the Customer's Copy of the statement. The amount also is shown on the parts of the statement that correspond to the Cashier's and Representative's Coupons, the same as on the regular bill.

The billing for gas heating service as measured by the house heating meter is at the lower blocks of the rate, and picks up at the point where the billing for gas service as measured by the other meter, or meters, stopped. The total of the billing under the Residential Service Rate on the regular bill and on the Statement of House Heating, therefore, is the same as if the use of gas for all purposes had been billed as one amount.

The amount shown on the Statement of House Heating is a "memorandum" charge only, so far as the customer is concerned. The consumption and amount shown on the Statement of House Heating is taken up in the sales for the month and is the company accounting record.

The copy of the Statement of House Heating that corresponds to the Cashier's Coupon of the regular bill is detached from the Customer's copy and forwarded to the Air Conditioning Representative. This copy is of value in checking the accuracy of the estimated monthly amount with the actual use of gas service.

The copy of the statement that corresponds to the Representative's Coupon is retained in the Central Billing Department.

Accounting Procedure

The Ledger Record obtained from the Customer's Bill is the company's accounting record for all but the house heating account. The Ledger Record obtained from the Statement of House Heating is the company's accounting record for the house heating account. The amount shown on the Customer's Bill under the Budget Plan does not enter into the sales and therefore is not considered in balancing.

All payments received for other than house heating are posted in the district office to the Ledger Record Copy obtained from the Customer's Bill. All payments received for house heating are posted to the Ledger Record Copy obtained from the Statement of House Heating.

During the first months of the heating season, the amount paid by the customer under the Budget Plan normally exceeds the actual consumption billed on the Statement of House Heating. Therefore, when the customer pays the bill his account shows

a credit balance. Such credit balances are carried forward each month on the Statement of House Heating. Later in the heating season this condition generally is reversed and the actual consumption billed exceeds the amount of the Budget Plan charge. This establishes a debit balance for the month, and offsets the credit balance previously set up. At the end of the year the budget plan amount and the actual charge are in approximate agreement.

If the customer fails to pay the amount agreed to under the Budget Plan during the current month, the unpaid amount is entered on the Customer's next bill as a separate item.

Meter Reading Records

The Meter Reading Record of each customer served with house heating under the Residential Service Rate whose account is to be carried under the Budget Plan, is stamped "Budget Plan, Monthly Payment \$——." This is the Central Billing Department's instruction to take up the monthly Budget Plan charge.

Adjustment of Estimated Use to Actual Use

The account of each customer served with House Heating under the Residential Service Rate Budget Plan is reviewed in the District Office each July.

The amount of the annual adjustment is the difference between the customer's total budget payments and the total charges for house heating service based on actual meter readings. The net debit or credit balance as of the July cycle is shown on the customer's regular bill for July.

An appropriate letter is written to each Budget Plan customer, explaining the transaction and stating that upon request a detailed statement will gladly be furnished.

Finds A. G. A. Accounting Service Helpful

THE following letter received by the American Gas Association is a significant example of the type of service available to members of the Association.

"Your booklet 'Gas Company Audits and Auditing' has proven very helpful to me during the past year in connection with the auditing of gas companies. It occurs to me that possible additional information on this subject may have been published since the above report in 1926, and, if so, I would appreciate receiving two copies of such publications. Also any information regarding other sources of data on gas company auditing will be appreciated.

"Will you please send me another copy of the above report in order that my assistant may have one for his file."

Named American Meter Vice-President

NORTON MCKEAN was elected vice-president of American Meter Company at a recent meeting of the directors. Mr. McKean first became associated with American Meter Company in 1919 as superintendent of its Boston plant, after which he was made general superintendent of the corporation and manager of its Albany, New York, plant—D. McDonald & Co. Works. He will continue in those executive duties.

Gas Showmanship

THE great majority of people are impressed only by exaggerations, be they of form, color or movement. That being so, we must give them showmanship. It is no criticism of the average gas engineer to say that, brought up in an atmosphere of facts, he is rarely anything of an impressario. He knows the technical facts about an appliance, and he cannot understand why anyone should ask for more.

Therein lies the reason why gas showmanship is not effective in the "box office." Showmanship is, in the nature of things, undignified; dignity and ballyhoo do not go together. Engineering is a dignified profession; showmanship, with due respect to the showman, is not; and it is none the worse for that. The simple fact is that merit unadorned carries no appeal to the masses; that is why those who make appeals over the radio seek for "adornment" in the actual appellant, regardless of the merits of their cause.

There was something lacking in showmanship when it was discovered in one American survey that only 3 per cent of the people bought new cookers because they understood why modern ranges cook better than the old ones. The other 97 per cent just bought them to keep pace with their neighbors. In other words sales were mainly due to chance circumstances, and direct and telling sales were not in the picture, due to some defects in their presentation.

—(The Gas Times, London), Oct. 2, 1937.

Commercial Section

Hugh Cuthrell, Chairman

J. W. West, Jr., Secretary

F. X. Mettenet, Vice-Chairman

"Prize Parade" Gas Water Heater Sales Contest Opens January 1, 1938



R. E. Williams

chairman of the A.G.A. Water Heating Committee. Sponsored by more than ninety-five per cent of the manufacturers of gas water heaters in the United States, the campaigns will take the form of a national competition open to any salesman or dealer directly concerned with the selling of automatic gas water heaters for installation.

The 1938 project will be known as the "1938 Prize Parade." Substantial merchandise awards will be distributed by the National Automatic Gas Water Heater Sales Committee during the period of the campaign which will be officially launched on January 1 and which will continue until October 31.

Dealer Support Enlisted

The year's extensive selling effort will enlist the support of gas companies and their salesmen as well as thousands of retail dealers throughout the country. The American Gas Association Water Heating Committee, under the direction of Chairman Williams, is cooperating with the Association of Gas Appliance and Equipment Manufacturers in the utility division participation.

As in the preceding annual promotional campaigns the new sales program will embrace gas company salesmen, and retail water heater dealers. But in its principal theme, the "Prize Parade" will be entirely different from previous projects in that it will not be a "contest" in the true sense of the word. Participants will not be competing against one another; there will be no classifications, divisional or geographical. Instead each will win prizes in direct proportion to his own sales efforts. Since every sale of an automatic gas water heater produced by a sponsor manufacturer will count toward one or

more of the valuable merchandise prizes, the number of prizes a participant can win will be limited only by the number of sales that he is able to close.

One of the important features of the plan is that it not only aims to stimulate the "star" salesmen to greater efforts, but to arouse the interest of the "low-producing" man who might become discouraged because of the superior progress of the "go-getter." With the guarantee of the campaign's enthusiasm—lifting slogan "Everybody Wins in 1938," no salesman should become discouraged during the program, it is pointed out.

According to the contest committee the rules will be simple. To each automatic gas water heater produced by sponsor manufacturers will be attached a prize certificate. Class A heaters will carry certificates valued at 50 points while Class B heaters will bear certificates valued at 25 points.

Prize Parade Catalog

A wide variety of more than 350 outstanding prizes will be vividly illustrated in the 1938 Prize Parade Catalog which the contest committee will furnish each entrant. Fine luggage, golfing and hunting equipment, clothing of every description, famous watches, home furnishings such as rugs, davenport, silver and glass ware, outstanding women's jewelry and toilet articles, and for the children toys, dolls and games, are but a few of the items shown in the catalog for which the prize certificates can be redeemed. Each award will have a definite point value.

To further insure continued activity during the campaign, the committee will distribute regularly and frequently sales promotion material.

One of the novel promotional features of the 1938 campaign will be the mailings to salesmen's wives. Pictorial letters and attractive booklets will show the other half of the family how they can help in selling and thereby acquiring many desirable prizes for themselves and their homes.

The sponsors of the 1938 campaign are: American Gas Products Corp., New York; Autogas Corp., Chicago; W. B. Bastian Manufacturing Co., Los Angeles; Cleveland Heater Co., Cleveland, Ohio; Continental Water Heater Co., Ltd., Los Angeles; Crane Company—Premier Heater Division, LaPorte, Ind.; Day & Night

Water Heater Co., Ltd., Monrovia, Calif.; EverHot Heater Co., Detroit, Mich.; Gas & Electric Heater Co., LaPorte, Ind.; General Water Heater Corp., Los Angeles; Handley Brown Heater Co., Jackson, Mich.; Hotstream Heater Co., Cleveland; Hoyt Heater Co., Los Angeles; Hoyt Heater Company of Northern California, Oakland; Hynes & Cox Electric Corp., Albany, N. Y.

Lawson Manufacturing Co., Pittsburgh; Lovekin Water Heater Co., Philadelphia; M P Water Heater Company, Los Angeles; Mission Water Heater Co., Los Angeles; Pittsburg Water Heater Corp., Pittsburgh; Ruud Manufacturing Co., Pittsburgh; Sands Manufacturing Co., Cleveland; Surface Combustion Corp., Toledo, Ohio; Superbo Manufacturing Co., Los Angeles; United American Bosch Corp., Springfield, Mass.; Welsbach Co., Gloucester City, N. J.; Whitehead Metal Products Co., New York, and John Wood Manufacturing Co., Conshohocken, Pa.

Gas Range Promotion Planned at Meetings

IMPORTANT meetings of the Domestic Range Committee and the Subcommittee for the Promotion of the Certified Performance Range were held at Association headquarters, New York, December 2 and 3 respectively. F. M. Houston, Rochester Gas & Electric Corp., Rochester, N. Y., is chairman of the Domestic Range Committee while the subcommittee's activities are being directed by Hall M. Henry, Utility Management Corporation, New York.

The principal purpose of the Domestic Range Committee meeting was the planning of a Range Sales Campaign to be held from August 1 to September 15, 1938. It was decided that the committee's efforts this year will be concentrated on this campaign. A subcommittee headed by Lloyd Ginn was appointed to prepare ideas for a prospectus for this campaign. The prospectus is to assist manufacturers in the preparation of advertising and promotional material.

Present at the meeting, in addition to Chairman Houston, were: F. D. Cadwalader, Karl Emmerling, J. I. Gorton, Lloyd Ginn, Hall M. Henry, C. W. Merriam, Jr., J. F. Quinlan, A. F. Rice, Eliza-

beth Sweeney, Paul Tappan, T. T. Taylor, W. H. Van Riper, C. C. Young, C. George Segeler, Jessie McQueen, and R. J. Rutherford.

The Subcommittee for the Promotion of the Certified Performance Range announced that the Executive Board had approved the holding of a prize contest to obtain a suitable name for the "super" range. The contest will be held within the industry, exclusive for employees of appliance manufacturers and open to all employees of utility companies dealing with gas. A large cash prize will be awarded to the winner.

The following attended the subcommittee meeting: Hall M. Henry, chairman, C. W. Berghorn, W. E. Derwent, S. L. Drumm, E. R. Guyer, F. M. Houston, J. L. Johnson, L. W. Johnson, J. W. Lea, S. E. Little, J. F. Quinlan, A. F. Rice, Paul Tappan, T. T. Taylor, and C. George Segeler.

Bulletin for Plumbers To Be Prepared

FOLLOWING distribution of interim bulletin No. 38 of the Commercial Section, entitled "How to Convince the Plumber That There Is Money in the Gas Business for Him," interest was so great that a special edition is contemplated. If demand warrants it a slightly modified version of the bulletin will be made available at a cost of 2 cents a copy in lots of 100 for distribution by gas companies to plumbers and dealers.

An attractive cover with the title changed to read "To the Plumber—There Is Money in the Gas Business for You," will be made up if the bulletin is reprinted. There will also be slight changes in the text. Reprinting in this form is contingent upon enough orders being received at headquarters to justify going ahead. Any interested companies should send their orders to H. E. Dexter, chairman, Appliance Financing and Dealer Relations Committee, American Gas Association, 420 Lexington Avenue, New York.

Gas Heating Group Holds Annual Meeting

DURING the past year more than 600 heating units, representing gas sales of approximately 150,000,000 cubic feet annually, were installed in the territory of The Brooklyn Union Gas Company. This information was brought out in a paper on "Commercial Space Heating Trends" by J. F. Quinn, presented at the eighth annual meeting of the Metropolitan Heating and Air Conditioning Council, December 15, at the Hotel Governor Clinton, New York City.

While not a cure-all for every heating

application, Mr. Quinn declared, the unit heater has great possibilities. He recommended that no heating equipment be sold without first making a heat loss survey. He suggested developing the market through the following sources: Classified Directories, Heating Contractors, Architects, Satisfied Users, Other Salesmen, Employee Sales Plan, Your Own Merchants, Trade Associations, Cold Canvass and Direct Mail.

Other speakers at the meeting were: Hugh H. Cuthrell, chairman, A. G. A. Commercial Section; F. W. Williams, A. G. A. Home Appliance Planning Bureau; J. E. Cook, Westchester Lighting Co.; Frank H. Trembly, Jr., chairman, House Heating and Air Conditioning Committee; Herbert G. Schaul, Westchester Lighting Company. J. J. Deely, chairman of the Council, presided.

A feature of the meeting was the showing of the sound slide film, "The March of Gas" by the Public Service Electric and Gas Company. A sales skit demonstrating the importance of good sales technique concluded the program.

Conversion Burner Sales

OCTOBER sales of standard gas conversion burners and attic insulation, a special combination offer, amounted to 481 in the territory of Consolidated Edison Company of New York and the Westchester Lighting Company, an increase of 29 over the same period last year. For the ten months' period of 1937, gas heating equipment sales totaled 2,327, an increase of 188 over 1936. Sales of attic insulation during October amounted to 169,397 square feet and since July 1, 1937, when the combination offer was introduced, a total of 708,500 square feet has been sold.

Water Heater Sales in New York

ATOTAL of 2,978 water heaters were sold by Consolidated Edison Company of New York and Westchester Lighting Company during the first ten months of 1937 compared with 2,774 for the corresponding period of 1936.

A Silent Cycle of Cold



L. E. LINDSAY, director of display advertising of the Seattle Gas Company, has produced a number of striking animated window displays with notable sales results. Some of these displays along with a few of Mr. Lindsay's ideas on the subject appeared in the A. G. A. MONTHLY for May, 1937. Reproduced above is his latest gas refrigerator display which he explains as follows:

"It has long been our wish to give the consumer some real idea as to just what a constant cycle of silent 'automatic cold' actually is—and how it is produced by—a small gas flame.

"Here, we believe, that we have accomplished the thing in showing a Refrigerator with its cycle brought out in front

—this consists of an actual Electrolux burner with a celluloid blue Neon flame under generator containing boiling liquid. We see clouds of freezing vapor as they pass up and through a complete loop and then into a condenser, and return in constant animated flow of liquid drops to the generator.

"Around the fixed 'bull's-eye'—carrying the words 'A Steady Constant Cycle of Cold' is a revolving group of cold ice cubes, and into the heart of this cold—we pass the contents of our shopping bag.

"The entire middle panel is full of live, sparkling animation that not only tells its story very well—but its movement gets attention; it may have a thought for others."

Home Service Gets Under Way



Mildred Clark

Mrs. Mary B. Burnett, Cincinnati; Karen Fladoes, Chicago; L. M. Johnson, Chicago; Ella Lambert, Milwaukee; Margaret Marable, Dallas; Claribel McLeod, Muncie; F. X. Mettenet, Chicago; Edna Mohr, Allentown; Jane Roberts, Philadelphia; Mattie Rouse, Flint; J. C. Sackman, Hammond; A. E. Schwarz, Cleveland; Dorothy Shank, Cleveland; Helen Smith, Rochester; Anne Sutter, Pittsburgh; Elizabeth Sweeney, Geneva; Harry Swenson, Chicago; Hulda Ungericht, Columbus; Leone Waddell, New York; and Jessie McQueen, New York.

Plan of Work

The 1938 plan of work for the Home Service Committee includes a revision of the Home Call booklet in line with new developments in calls in the homes of customers. Committee members reported that the older book had been used "almost as a Bible" in home service departments. With the new sales-slanted approach, and the increasing importance of the survey call, a new edition seemed advisable.

Following a four-year-cycle plan a questionnaire on home service activities will be prepared and submitted to all home service departments with the results tabulated for distribution at the A. G. A. Convention next fall.

Due to the success of the Home Service Conference and Training Course in Cleveland in June it is the plan this year to take the Conference to Kansas City for three days in the early part of June. Announcements of the program and dates will be mailed to the industry early in the new year. Other home service programs in connection with regional sales conferences and regional associations will be encouraged with local chairmen assuming responsibility for programs.

Other parts of the committee work include a continuation of the Budgets and Operation study; home service assistance in an "increased load and continued use" campaign; cooperation with the commercial Section sales campaigns; and a summary of plans used in employee classes.

The committee members were guests at a luncheon of The Peoples Gas Light & Coke Company. Following the committee's sessions the group was taken on a personally conducted tour of the gas company display kitchens and newly modernized home service auditorium by Vice-President F. X. Mettenet and Harry Swenson, home modernization counsellor, of the Chicago company.

Field Trip

En route to the Home Service Committee meeting in Chicago, Jessie McQueen, A. G. A. home service counsellor, visited the home service departments in Syracuse and Detroit. In Syracuse Margaret Nevins, home service director, conducted her through the new Five Star home sponsored by the Cen-

tral New York Power Corporation. The five stars stand for: 1. Wiring for the future; 2. Lighting for eye comfort; 3. Step-saving kitchen; 4. Automatic water service; 5. Inside weather control; and every feature has been so carefully developed that it has aroused much interest in Syracuse and the surrounding territory. A talk on "Home Service Today" was given before the equipment students at Syracuse University at the invitation of Mrs. G. L. Connor whose application of equipment study to home service work has been so well done that many of her students have been absorbed into home service departments.

them new members recently secured directly upon graduation from near-by home economics colleges, were in attendance. Miss McQueen outlined home service work, described work under way in other companies in the country and developed questions and answers on work done by the group present. Of particular interest was the success of the survey performed by the home service directors in the Kansas City Gas Company through calls in the homes of customers to secure information on how equipment was being used, the attitude of customers toward the use of gas and other useful information.

Visiting The Laclede Gas Light Company, St. Louis, Miss McQueen met with the ten members of the home service staff under the direction of Mary Louise Hurs-



Members of the home service department, The Gas Service Company, Kansas City, Mo., including the three home service directors: Betty Boyle, The Gas Service Company; Mary House, The Kansas City Gas Co., and Mildred Rittenhouse, The Wyandotte County Gas Co.

ter, with G. H. Schlatter, sales manager, also in attendance. Here an opportunity was given to learn more of the classes there under way for debutantes,—a request by the girls themselves for full instruction on the use of modern gas equipment; also to learn of the cooperation given by home service in the new sales floor kitchens in the St. Louis department stores.

At Webster Groves, Missouri, The St. Louis County Gas Co. has recently opened a new building and the home service auditorium was an attractive feature. W. L. Jones, sales manager, explained that one new feature in its decoration was the use of a soft shade of blue linoleum on parts of the wall and bases of counters, not only to add color, but to lend an appearance of warmth in a soft wall surface.

At Columbus the visit coincided with a district sales managers' meeting under the direction of E. M. Tharp, vice-president and general manager. The value of home service work was frequently pointed out by these district managers in their reports. Hulda Ungericht, home service director, and J. E. Humphrey, advertising manager, outlined the success of the Gasco Food

(Continued on page 39)

Industrial Gas Section

Hale A. Clark, Chairman

Eugene D. Milener, Secretary

Frank H. Trembly, Jr., Vice-Chairman

Advanced Applications of Gas to Forging Fine Steels



A. M. Steever

THE subject of atmospheres as applied to ferrous metals can readily be divided into two parts: First, furnaces where the materials being heated are protected from the products of combustion and where especially prepared atmospheres are introduced into the heating chamber;

second, where the products of combustion come into contact with the materials being heated. This latter type of furnace is usually called direct fired and may be described as one producing a reducing or oxidizing atmosphere. The reducing atmosphere contains excess or combustible gases, whereas the oxidizing atmosphere has excess air and is made by complete combustion plus excess air.

Better Fuel Economy

The oxidizing atmosphere provides better fuel economy than the reducing atmosphere because of the fact that with reducing atmospheres unburned fuel passes out the flue and escapes from the furnace. However, with the oxidizing atmosphere, the product oxidation is proportionate to the excess air, other things being equal, and some loss results from scaling of the product during the heating operation.

With reducing atmospheres in direct-fired furnaces for ferrous metal heating furnaces, serious decarburization of the product occurs with some scaling, for which reason the oxidizing atmosphere offers greater advantages, generally speaking. For this reason the writer is most concerned with the possibilities of oxidizing atmosphere and the results presented in this paper represent accomplishments with this so-called oxidizing atmosphere.

In the manufacture of fine steels, we feel that one of the most important problems, if not the most important, is the absolute control of the heating processes. These steels have a wide application for precision tools of all classes and depend upon subsequent heat treatments for their ultimate properties.

Presented before Industrial Gas Section, A. G. A. Convention, Cleveland, Ohio, Sept. 28, 1937.

By ADAM M. STEEVER

Superintendent, Columbia Tool Steel Company, Chicago Heights, Ill.

Before the advent of accurate heating control, the manufacturer had many perplexing problems that were attributed to improper heating of product. Some of these problems were the inability to control decarburization, rate of heating, maximum heating temperatures, elimination of overheating and actual burning of product and scaling.

Facing these problems it required several years of laboratory research and shop experiment, with all manner of devices, before proceeding with the conversion of a furnace to a completely controlled gas-fired unit.

This initial installation involved the conversion of furnaces with hearths up to 16 feet in length, 7 feet in depth, with loading capacities up to 30,000 pounds of product per charge.

For many years previous, furnaces of this type had been fired with coal, in accordance with the general practice in the tool steel field. It was known that gas fuel had been used, at various times over a period of many years, with indifferent success.

New Gas Approach

During the several years of research and experiment preceding the first conversion, an entirely new approach to the problem of gas use was responsible for the success of this installation. This new approach involved the recognition of the fact that gas is a metallurgical chemical as well as a source of heat. Although gas, as a fuel alone, showed little superiority over other fuels, it is outstanding as a metallurgical chemical over all other fuels. This superiority is due to the flexibility of control, chemically and otherwise, making it possible to provide the exact chemical condition and reaction needed for a specific process and to deliver the exact quantity of fuel at any desired point.

Control instruments were set up in recognition of these principles. They included recording temperature controllers, automatic gas and air regulating valves, a recording carbon dioxide recorder and accurate furnace pressure gauges and gas pressure regulators.

The conversion work involved redesigning the combustion end of the furnace in order to give satisfactory dimensions and conditions for proper combustion. Multiple low pressure burners, having a capacity of 2100 cubic feet per hour of 1000 B.t.u. natural gas, with 12-ounce air supplied by an individual blower, supplied the heating medium. The combustion chamber was decided on for this first job, which was approximately 7 feet wide, 6 feet long, and provided the necessary volume for combustion and complete equilibrium of the gases before passing over the product being heated. Experiment showed that in using an air-gas mixture to produce an oxidizing atmosphere of approximately 11% CO₂, 1% O₂, a fine scale was produced, and removed very readily during the period of mechanical working of the product; also that no total carburization appeared upon the surface of the materials. A slight decarburization of the surface exists but the fact remains that it was reduced 66% and scaling 75%, compared with the prior standard practice.

Gas Insures Uniformity

With coal fuel these furnaces operated under negative pressure. With gas fuel they operate under positive pressure, which insures complete atmosphere uniformity throughout the furnace.

Atmosphere tests made throughout the length of the furnace chamber after the gases leave the combustion zone, show complete uniformity.

From the experience gained from the first unit, six additional furnaces were converted to gas and further, to meet increased demand for product quality, new furnaces have now been designed and installed with additional improvements in construction.

During the short time these newly built units have been in operation, which serve steam forging hammers ranging in falling weight from 750 to 8000 pounds, they have shown an added improvement in performance, including further reduction in scale and in the control of surface decarburization, resulting in a greater net return per pound of material processed. In addition, speed of heating plus accuracy of temperature control, which has come to be taken for granted in installations of this type, has further improved the quality of the finished work.

The new furnaces embody improvements in combustion chamber design and in the application of burners and controls which are the fruit of additional research, together with experience from the original conversion jobs.

The research was directed chiefly to the problem of complete combustion control,—in other words, the achievement of a heating flame of definite size and characteristics, the products of which have proved to be most desirable for this type of heating. The operation of these furnaces has resulted in a closer approach to perfection in this respect than has been achieved in any known similar installation.

Accuracy of combustion control has been made possible by two factors: the availability of a supply of natural gas of uniform heating value, and the combustion of this gas, at positive pressures, with a uniform and predetermined air supply. This practice results in the practical elimination of variables in the combustion equation.

New Furnaces

The newest furnaces are box type and of the so-called portable design, involving a steel underframe resting on but not fixed to a heat resisting concrete slab which permits expansion and contraction and transmits a minimum of ground shocks to the furnace proper. This construction is expected to contribute substantially to longer furnace life and to reduce repairs to the refractories. They are also designed so they can be moved to new locations, should plant practice make this desirable. Having no stacks and being connected only to gas and air lines and to control instruments, which are easily moved, these furnaces are strictly portable. They are lined with the new increased alumina super refractory fire brick, backed with light weight insulating brick.

In use, the heating program is an exact schedule determined by the Job Foreman. By means of a program slate the foreman indicates his instructions for the complete 24 hour program. The operating shift starts at 7:00 A.M. after the heating program has gradually brought the charge to temperature, allowing one hour soaking time between the hours of 6:00 and 7:00 A.M. A recording pyrometer shows whether or not these instructions have been followed by the heater; likewise, continuous gas analysis apparatus shows whether or not desired combustion has been maintained.

Further reduction in gas consumption has followed in furnace design from the utilization of insulation. Insulation has also contributed substantially to the comfort of hammer crews working near the furnace.

An air curtain is provided at each furnace door for protection of the operators. This curtain also serves to cool the door and door frame castings. These furnaces also operate at a slight positive pressure, which is the result of the measures taken to control atmospheres. A propane standby has been installed which makes it possible to change over to substitute fuel at any

time without any interruption or furnace adjustments whatsoever.

Incidental to this furnace practice, but important in the opinion of the management, is the fact that the controlled gas firing makes possible a floored, lighted, comfortable, clean shop, free from soot, scale and cinders. All furnaces and equipment, such as rolling mills, hammers, shears, etc., are kept in a clean aluminum-painted condition, all of which is conducive to the new standards of workmanship required.

It seems plain that gas has a definite place in the modernization of ferrous metal

manufacturing and fabricating plants. It may represent added capital expense but the advantages offered are enormous. If gas modernization is carefully studied, improved product quality and quantity can in most instances be made to more than pay the costs. Incidental items, such as reduced maintenance costs and reduced spoilage, can be made to add to the profit. Certainly in the manufacture of tool steel it is as true that it pays to use good methods as it is true from the customers' point of view that—

"It pays to use Good Tool Steel."

Gas Takes the Lead at Restaurant Convention



Gas commercial cooking exhibit at the restaurant convention.

STRETCHING for nearly one hundred feet along famous Peacock Alley of Washington's swank Mayflower Hotel, and backed by a brilliantly lighted blue and cream colored background, was an array of gas commercial cooking equipment seldom seen on display at one place. Such was the setting at the restaurant exhibit and convention December 6-8, sponsored by the National Restaurant Association, where the A. G. A. Industrial Gas Section, the Washington Gas Light Company, and five appliance manufacturers combined to make an unusually effective display. The cooperating manufacturers were Standard Gas Equipment Corporation, General Gas Light Company, Detroit-Michigan Stove Company, American Stove Company and J. C. Pitman & Sons Inc.

Several thousand restaurateurs were impressed with the style, beauty, variety and durability of heavy duty gas cooking, baking and heating appliances as they are being offered today.

The exhibit spread out like a bird's wings on each side of a center space presided over by Miss Mae Chaimson, charming hostess to those who visited the gas display. Heavy duty ranges with insulated ovens and thermostatic controls, of course, were featured. But broilers were much in evidence as were the popular new deep fat fryers, new deck bake ovens, water heaters, gas boilers and fine looking unit heaters of the—"floor or ceiling types, take your choice, suh"—yes, there were a lot of Southern operators present.

The entire gas exhibit was styled around the modernity, economy and practicability of the new gas appliances. Each appliance was placed so that it was seen by everyone who attended the convention, but inviting, comfortable furniture was so placed that visitors had front row seats for closer inspection and demonstration of any appliances in which he or she was interested.

Surrounded by displays of all the things that go to make up the modern restaurant,

the cooperative gas display in itself, however, made the crowds conscious that gas is the leader in furnishing the restaurant industry with modern cooking and heating service.

Attendance was from eleven states and a particularly large number of tea room owners were noted in the crowds.

The maximum effectiveness of an exhibit of equipment can only be reached when visitors are received on a personal basis. The show was open from nine each morning until half after ten at night, and relays of men selected from the following welcomed restaurant people at all hours: John B. Wynne, Detroit-Michigan Stove Company; Porter Hurd, General Gas Light Company; William H. Frick and Fred Todd, American Stove Company; Alfred T. Pitman and Frank Collins, J. C. Pitman & Sons Inc.; Clarence H. French and Gail Crawford, Standard Gas Equipment Corporation; Eugene D. Milener, American Gas Association; and the following Washington Gas Light Company sales group: Henry M. Brundage, R. S. Agee, Thomas M. Offutt, A. J. Maloney, Harry Kerr, James Hayes, A. J. Pessagno and F. B. Hatcher.

A stainless steel gas Frialator, of the type used to deep fat fry small batches in full view of restaurant patrons, was raffled off on the stage of the convention at the

Tuesday night get-together, by J. C. Pitman & Sons Inc. Excitement was keen when Mrs. Julius Lully drew the lucky number. Mrs. Lully is the wife of the proprietor of Harvey's Restaurant, Washington, one of the most distinguished eating places in America. Now that this new gas fryer is in the family, Mr. Lully is planning all kinds of new fried food services for Harvey's.

On Wednesday, Eugene D. Milener, secretary of the Industrial Gas Section, addressed the convention on "Keeping Gas Service in Tune with Modern Restaurant Requirements." While particularly pointing out the new features that make heavy duty gas equipment the pace setter for modernity, Mr. Milener, by the use of tables and various illustrations, explained the advantages of low temperature roasting and other methods of operating that mean better food and distinct economy. Features of gas service to restaurants other than cooking and baking were likewise described, all from the standpoint of modern conceptions of such services.

The Washington Restaurant Exhibit was one of the series of industrial and commercial exhibitions throughout the country regularly participated in by the Industrial Gas Section through its Committee on Displays at National Industrial Expositions of which Paul Ziegelbauer of Detroit is chairman.

Wirt F. Kimball, *Vice-Chairman*, Cambridge Gas Light Co., Cambridge, Mass.

Gas Engine Power Committee

E. P. Kramer, *Chairman*, Atlanta Gas Light Co., Atlanta, Ga.

Ralph H. Wenner, *Vice-Chairman*, The Ohio Fuel Gas Co., Toledo, Ohio.

Industrial & Commercial Air Conditioning

Charles R. Bellamy, *Chairman*, Columbia Gas & Electric Corp., New York, N. Y.
James C. Patterson, *Vice-Chairman*, Carrier Corporation, Syracuse, N. Y.

Committee on Nominations

Ralph L. Manier, *Chairman*, Central New York Power Corp., Syracuse, N. Y.
Charles W. Gale, *Vice-Chairman*, Knoxville Gas Co., Knoxville, Tenn.

Non-Ferrous Metals Committee

Ralph D. Hawkins, *Chairman*, The Bridgeport Gas Light Co., Bridgeport, Conn.
S. Procter Rodgers, *Vice-Chairman*, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.

Program Committee

Franklin T. Rainey, *Chairman*, The Ohio Fuel Gas Co., Columbus, Ohio.
W. Jennings Young, *Vice-Chairman*, Oklahoma Natural Gas Co., Tulsa, Okla.

Publicity Committee

H. A. Sutton, *Chairman*, Public Service Electric & Gas Co., Newark, N. J.
Harold O. Andrew, *Vice-Chairman*, Robbins Publishing Co., New York, N. Y.

Sales Training Committee

Wm. Wirt Young, Jr., *Chairman*, Watertown, Conn.

Volume Water Heating Committee

Lawrence E. Biemiller, *Chairman*, Consolidated Gas Electric Light & Power Co. of Baltimore, Baltimore, Md.
Arthur E. Stack, *Vice-Chairman*, Washington Gas Light Co., Washington, D. C.

Wholesale Baking Committee

Clinton B. Cole, *Chairman*, Rochester Gas & Electric Corp., Rochester, N. Y.

1938 Industrial Gas Section Committees Appointed

FOLLOWING is a list of committees of the Industrial Gas Section, American Gas Association, together with the newly elected chairman and vice-chairman of each who will serve until September 30, 1938.

Managing Committee

Hale A. Clark, *Chairman*, Detroit City Gas Co., Detroit, Mich.
Frank H. Trembly, Jr., *Vice-Chairman*, The Philadelphia Gas Works Co., Philadelphia, Pa.

Advertising Committee

J. P. Leinroth, *Chairman*, Public Service Electric & Gas Co., Newark, N. J.
Flavius B. Jones, *Vice-Chairman*, Equitable Gas Co., Pittsburgh, Pa.

Advisory Committee

Ralph L. Manier, *Chairman*, Central New York Power Corp., Syracuse, N. Y.
Charles W. Gale, *Vice-Chairman*, Knoxville Gas Co., Knoxville, Tenn.

Advisory Committee on "Combustion" Handbook

W. Stockton Walker, *Chairman*, Consolidated Edison Co., of N. Y., Inc., New York, N. Y.

Leon Ourusoff, *Vice-Chairman*, Washington Gas Light Co., Washington, D. C.

Ceramic Industries Committee

Oliver Lloyd Maddux, *Chairman*, United Gas & Fuel Co., of Hamilton, Ltd., Hamilton, Ont.
George M. Parker, *Vice-Chairman*, Mississippi River Fuel Corp., St. Louis, Mo.

Commercial Cooking & Baking Committee

Lawrence R. Foote, *Chairman*, Central Illinois Electric & Gas Co., Rockford, Ill.
Roy E. Wright, *Vice-Chairman*, New England Gas & Elec. Assn., Cambridge, Mass.

Committee on Displays at National Industrial Expositions

P. Ziegelbauer, *Chairman*, Detroit City Gas Co., Detroit, Mich.

Ferrous Metals Committee

Robert G. Guthrie, *Chairman*, Peoples Gas Building, Chicago, Ill.
Edward W. Esslinger, *Vice-Chairman*, Cincinnati Gas & Electric Co., Cincinnati, O.

Food Industries Committee

T. W. Halloran, *Chairman*, New York Power & Light Co., Albany, N. Y.

Gas Air Conditioning Committee Meets

MEETING November 23 in New York City, the Committee of Executives on Air Conditioning, under the chairmanship of Walter C. Beckjord, vice-president, Columbia Gas and Electric Corp., New York, discussed the development of gas equipment in this field. Special attention was devoted to the summer air conditioning industry.

After considerable discussion the com-

mittee reached the following conclusions:

That progress is being made by manufacturers toward gas dehydration equipment particularly suitable for residential service;

That progress is also being made toward adsorption refrigeration equipment suitable for air conditioning sizes up to three or four tons;

That the most advantageous course for the industry at the present is to concentrate on industrial and commercial air conditioning by means of both dehydration method and gas-engine-driven refrigeration method;

That the air conditioning industry is slowly but steadily veering toward greater humidity reduction.

Present at the meeting in addition to Chairman Beckjord were: Frank H. Adams, J. A. Brown, R. L. Fletcher, W. F. Friend, N. C. McGowen, George F. Mitchell, Herman Russell, Louis Ruthenburg, Eugene D. Milener, B. S. Beach, C. W. Bennett, W. L. Fleisher, William R. Hainsworth and Frank H. Tremblay Jr.

Carrier Enters Gas Air Conditioning Field

AN announcement of great interest to the gas industry has been made by the Carrier Corporation, Syracuse, N. Y., one of the leaders in the field of air conditioning. By joint arrangement with The

Bryant Heater Company, Cleveland, Ohio, Carrier will add Silica Gel gas-operated dehydration equipment to its line of air conditioning apparatus. The Bryant Heater Company will continue to distribute gas-operated Silica Gel equipment through its own organization.

In making this announcement, the one major company devoting itself exclusively to air conditioning recognizes the need for a proven means of direct dehumidification as an economical alternate to mechanical refrigeration for those applications where it is desirable to control the moisture content in air (humidity) independently of the temperature of air. Direct dehydration by Silica Gel, using gas heat energy, embodies all the advantages of adaptability, effectiveness and economy, particularly in the production of low dew points or low humidities.

The announcement is in tune with an increasing realization that before the full value of true air conditioning can be felt in terms of complete satisfaction to the user, it was most desirable that a strong organization be placed in position to offer, engineer and install the various proven methods without bias, and to accomplish this through channels specifically equipped and trained for that purpose. Carrier Corporation meets this specification.

Silica Gel dehydration, using gas heat energy, was developed, tested and introduced under the sponsorship of the Committee on Industrial Gas Research of the American Gas Association.

Third Volume of Gas Appliance Service Series Completed

THE third volume in the Gas Appliance Service Series has just been completed by the American Gas Association. This is the Commercial Kitchen Manual which deals with the installation and servicing of the various types of appliances used in hotel and restaurant kitchens.

This book is written in the same style as the two previous volumes; the Range Manual, now in its third edition, and the Water Heater Manual, now in its fourth printing.

These manuals discuss, first of all, the various types and sizes of appliances available. They then take up the installation of these appliances. Specific instructions are given as to the location and arrangement, size of piping required, flue connections, and other problems confronting the man making the installation.

General servicing principles are next laid down covering all the fundamental background which applies to the appliances in general. The last and largest section of each manual takes up specifically the equipment produced by various

manufacturers, giving exact instructions for servicing the particular appliance confronting the fitter. This section is liberally illustrated with phantom views. The servicing instructions are lettered on these drawings so that the fitter can hold the manual in one hand, look at the drawing, compare it with the actual device, and adjust the device in accordance with the instructions lettered on the drawing.

Most of the large gas companies have found the manuals so useful that they have provided each fitter with copies. The increasing complexity of gas appliances makes it practically impossible for any man to have an intimate knowledge of the details of all the various makes and models of appliances now in common use. By carrying this information with him in a convenient manual, it is made instantly available when needed. The rapid technical advances in the gas industry have made it more necessary than ever before that appliances should be properly installed and adjusted in order to bring out their full capabilities.

—Stanford Setchell.

GOING AHEAD

WITH INDUSTRIAL GAS

The number of prepared gas atmosphere machines in use is now up in the hundreds. 'Twas not so long ago that the Research Committee was struggling in the test tube stage with prepared atmosphere.

The Blodgett Oven Company is the latest manufacturer to use the Industrial Gas Section's chart, "The Trend Today Is To GAS," in their advertising. The more everyone uses it the more effective it becomes.

Have you noticed the increasing number of industrial gas equipment manufacturers using 2-color advertisements in trade papers. Looks like a mighty good sign.

American Stove Company at their Harvey plant and George D. Roper Corporation, Rockford, are two Illinois stove companies that have put in gas radiant tube enameling furnaces. Better furnaces make better gas stoves.



Speaking of modern gas ranges, here's what 7 of the heavy duty type at Notre Dame are called upon most any day to handle:

1 ton of French fries
5,000 lamb chops
17,000 lb. of chicken
2,100 lb. of fish

It keeps 8 chefs hustling to see if they can keep up with the speedy gas ranges on the one hand and a hungry student body on the other. Any one of the above orders is devoured in 33 minutes.

How's this for speeding things up with gas? Wire baking by a new process takes 5 minutes against several hours previously, and the B.t.u. cut is from 150,000 to 100,000 per ton.

That was a whopping order for gas bake ovens taken recently. 52 ovens for one of the smartest chains in the country.

Looks like Charlie Lekberg pulled something out of the hat with that paper on submerged combustion. There's been a big demand for reprints.

Technical Section

J. V. Postles, Chairman

H. W. Hartman, Secretary

F. M. Goodwin, Vice-Chairman



King Photo

Managing and Advisory Committees of the Technical Section in session at the Belmont Plaza, New York, November 22. Left to right, foreground: F. C. Weber, R. G. Griswold, A. H. Abbott, L. W. Tuttle, H. L. Gaidry, H. K. Seeley, F. M. Brewster, A. M. Beebe, Gladys Hanshaw and J. V. Postles, chairman. Left to right, background: F. A. Lydecker, E. F. Weeks, W. J. Murdock, J. H. Wolfe, F. B. Parke, Prof. J. J. Morgan, J. F. Anthes, Erick Larson, Dr. A. R. Powell, D. S. Reynolds and F. M. Goodwin. E. A. Munyan was present but not in the photograph

Technical Section Plans for 1938

CONSIDERATION of the work of the Technical Section at any time must start with what has been done in the immediate past. Last year, under the able leadership of Martin I. Mix of Chicago, this Section started many activities that are being continued this year.

The work of this Section divides itself into three natural divisions, Chemical, Gas Production and Distribution. These divisions are headed by committees, the work of which will be discussed in turn. In addition to these three main committees there is a new one on Gas Conditioning. This last committee was created to fill a need, as expressed at the Cleveland meeting by O. S. Hagerman, for better coordination of the data on the qualities in our product that cause troubles and a planned attempt to eliminate them.

Chemical Committee Program

The Chemical Committee, under the chairmanship of Professor J. J. Morgan of Columbia University held their organization meeting in New York on November 10 and have outlined a good year's work. They will have the revised volume of the Gas Chemist's Handbook on "Interpretation and Application of Gas Analyses" ready for editing very shortly and work is progressing on the volume on "Sampling and Analyses of Gases."

Problems in gas purification including the determination and removal of organic sulphur will receive attention as well as the recovery of sulphur from spent oxide.

By J. V. POSTLES

Chairman, Technical Section

Under new developments, meter diaphragms and diaphragm dressings, oil scrubbing treated as one of the unit operations of chemical engineering of special interest to the gas industry, the mechanism of combustion, and shade tree protection will be investigated.

The subcommittee on analyses and tests will consider the specific gravity of gases; the question of microscopic methods of

analyses of interest to gas men; the study of the methods of determining oxides of nitrogen, and their relation to gum formation; and the standardization of odors for gas.

The Chemical Committee is cooperating with the Gas Production, Distribution and Gas Conditioning Committees in helping to solve the problems of special interest to these committees.

The Spring Conference of the Chemical and Gas Production Committees will be held in New York next May.

The Gas Production Committee met on



King Photo

Distribution Committee meeting at the Belmont Plaza, New York, November 19. Starting at head of table and reading from right to left around the table: H. L. Gaidry, chairman, H. W. Hartman, O. H. Folger, Wm. Lawton, Jr., D. P. Allen, Herman Horstman, H. B. Andersen, (Erick Larson and H. L. Peden at table but not in photograph), F. M. Goodwin, J. V. Postles, E. M. Bliss, E. H. Eacker, C. S. Goldsmith, C. H. Waring, L. W. Tuttle, A. V. Smith and C. F. Turner

November 9 in New York with Charles R. Locke, as Chairman, for the year. Papers are planned on the examination of Holder Coupons, the cathodic protection of condensers where dissimilar metals set up electrolytic action and the effect of ash on brickwork.

This committee has two main subcommittees—

First, Water Gas, which will endeavor to report on the reverse flow water gas process, the use of butane in all the various ways it can be used by gas companies, the blending of various gases to maintain a uniform mixed gas, the reforming and production of high B.t.u. gases, and light oil recovery. This last subject will give some of the practical applications of the theoretical paper on scrubbing presented by Professor Furnas of Yale University at the Cleveland convention last Fall.

It was thought advisable that this committee keep advised on the economics of materials which in the future may be available for water gas manufacture. It is realized that changes in the market prices may necessitate changes in production methods.

The second main division of the Gas Production Committee is the Carbonization Subcommittee which will continue to study the expansion of coal during carbonization, the elimination of dust, and coke plant accidents.

The Builders' Section will report the new equipment available to the industry.

Distribution Plans

The Distribution Committee, H. L. Gaidry, chairman, held its organization meeting in New York on November 19. It was decided to hold the Committee Conference in Cincinnati on April 4, 5 and 6.

The subcommittee on pipe joints and pipe material will make a report on welded joints. A study is being made of material, personnel and the necessity of periodic inspection to insure high grade work.

At the conference, reports will be made on the testing of expansion joints, meters and metering, and the structural strength of gas mains. This last subject will be particularly interesting to all gas men as data are being assembled on the causes of main failures.

Our research associate, Dr. Scott Ewing, is continuing his work on corrosion. Dr. Ewing is preparing a handbook on this subject which will be in headquarters' hands the early part of 1938.

The following interesting list of subjects for luncheon conferences to be held during the Distribution Conference next April, has been suggested:

- (1) Appliance Installation and Servicing.
- (2) Year 'Round Air Conditioning.
- (3) Gas Measurement and Pressure Regulation.

The Place of Engineers

(Portion of address by Dr. Harvey N. Davis, President of Stevens Institute, before the American Institute of Mining Engineers, Atlantic City, October 20, 1937)

"I like to think that just as the engineer-technicians of a century ago have developed into engineer-managers of unsurpassed skill today, so they in turn may develop into the engineer-administrators of tomorrow, able, as Mr. Mooney puts it, 'to philosophize about the general scheme of things' and to feel 'the changes of the industrial tides' to which from time to time they have to adjust each his own industrial activity. Here is the real place of the engineer in modern life.

"Here, too, is today's challenge to the schools of engineering. Not that we can easily train young men to be industrial administrators in this new sense. Heaven forbid. We had enough of that sort of thing in the recent wave of attempting to train college boys to be executives. But we can recognize the utmost heights of the paths that lie ahead for the very best of our students, and the lesser but still significant heights that lie ahead of that majority of our students who are even now regularly going into business and industry as distinguished from the more technical careers of the profession of engineering. And having recognized these possibilities we can at least do our utmost to give these young men something of the background and something of the understanding that will inspire them to grow in wisdom as well as in technical skill throughout their lives so as to be ready, each for his own chance when it comes. If we can do that, we shall have made a vital contribution to the maintenance of civilization."

- (4) Employee Training and Dealer Relationship.

- (5) Relation—Employee and Public.

The new Committee on Gas Conditioning, to which reference was made previously, held its organization meeting in New York on November 9. The chairman, O. S. Hagerman, outlined the scope of the committee and the most pressing problems of gas conditioning were selected for immediate study. They consist of dust for the natural gas men, organic sulphur and gums for the manufactured gas men.

It was decided to start each problem with a search of the work that has already been done and if basic research is necessary to recommend it. As this will take time it was pointed out that all the committee will likely be able to do this year will be to plan and start the attack and the actual solutions will come later.

While it is anticipated that the work as outlined will be presented at either the conferences or at the Fall convention, it is quite possible that the plans of the various committees may be changed and in some instances no reports made this year on some subjects and other subjects, not anticipated at this time, will take their place.

Chemical Treatments of Coal

CHEMICAL mixtures designed for the treatment of coal, with a view to making the coal burn better, really have little effect on the combustion of the fuel, it has been found by engineers of the Bureau of Mines, Department of the Interior, after the making of exhaustive tests. The results of the investigation are detailed in a bulletin just published by the Bureau.

Factors studied in detail were the effects of the chemicals on rates of ignition and combustion, on caking of coal in fuel beds, on tar and soot carried from the fuel beds, on soot deposited on surfaces of the furnaces and flues, on the emission of smoke, on the ash and clinker, and on the reaction of the sulphur in the fuels.

The tests show that the possible fields of application of the pretreatment of fuels with any chemical are extremely limited. The effects of light treatments of the order of 4 pounds of chemical alone per ton of fuel, apart from the water that might accompany its use, were so small under any conditions of burning that they could not account for the improvement that users of treatments in this or smaller amounts have believed they observed in service. The effects are about proportional to the amount of treatment applied. No efficacy was found for a mixture of chemicals, and each ingredient seemed to act in proportion to the amount that was present. Too much chemical applied to the surfaces of a fuel smothered it and hindered ignition and burning.

The tests also showed that any changes that treatments can make in the burning of coal or coke decrease in magnitude as the rate of burning increases, and that differences are small at rates of burning higher than 10 to 15 pounds of coal per square foot of grate per hour, even with treatments as high as 40 pounds per ton of fuel.

These findings do not in any way relate to the effectiveness of any material in reducing the dustiness of coal.

The results of these investigations are given in Bulletin 404, "Burning of Coal and Coke Treated with Small Quantities of Chemicals," by P. Nicholls, W. E. Rice, B. A. Landry and W. T. Reid, copies of which may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at a price of 15 cents each.

Testing Laboratories

R. M. Conner, Director

Managing Committee: J. S. DeHart, Jr., Chairman

N. T. Sellman, Secretary

Important Changes in Requirements Adopted by Committees

A NUMBER of recently reorganized requirements subcommittees, as well as the A. G. A. Approval Requirements Committee held meetings late in November and early in December at the Association's Laboratories in Cleveland. These meetings were grouped closely together to permit attendance of members from the Pacific Coast states and to minimize the expense for other members serving on two or more committees. The A. S. A. Sectional Committee, Project Z21, A. G. A. Approval Requirements Committee, recently reorganized to include manufacturer representatives nominated by the Association of Gas Appliance and Equipment Manufacturers, took action on a number of important items at its meeting on December 3, the principal ones of which are briefly summarized below:

Central Heating Gas Appliances

At its meeting in Cleveland on November 19 the Subcommittee on Approval Requirements for Central Heating Gas Appliances reaffirmed previous action in increasing the minimum allowable thermal efficiency for fan-type furnaces 5% above that specified in the current standards. The subcommittee also recommended that this be acted upon immediately by the Approval Requirements Committee and made effective January 1, 1938. The subject was discussed at the December meeting of the latter committee and the recommendations of the subcommittee approved. The minimum permissible efficiency requirements for gravity type furnaces, floor furnaces and boilers remain as now specified in the current standards.

Domestic Gas Ranges

Upon recommendation of the Subcommittee on Approval Requirements for Gas Ranges made at the November 17-19 meeting of that group, the Approval Requirements Committee approved the discontinuance of combustion tests on gas ranges at the normal pressure adjustment on natural, manufactured, propane and butane-air gases. This change in the range standards was approved for immediate application on the part of the Testing Laboratories.

Hereafter adjustment of appliances for the combustion test will be made at normal pressure as formerly, but samples will be taken and analyzed only at 50% below normal and 25% above normal pressures. This change does not affect the combustion



Subcommittee on Approval Requirements for Gas Water Heaters at a meeting in Cleveland, November 22. Left to right: R. D. McNeice, L. Onrusoff, H. W. Geyer, F. A. Wegener, E. J. Horton, chairman, M. G. Farrar, J. Mueller, (substituting for E. S. Hoyt, Jr.), C. H. Waring, Arthur Friedman

tests made with the range adjusted and tested at 4" water column inlet gas pressure with natural gas and 2" water column inlet gas pressure with manufactured gas and similar tests specified for ranges designed for use with propane and butane-air gas.

Use of Auxiliary Tags and Labels

Meeting early in 1936 the Approval Requirements Committee authorized the preparation and distribution on the part of the Laboratories of auxiliary tags and labels of the Approval Seal which could be attached in a conspicuous position to approved gas appliances and which might readily be removed by the consumer after the appliance was installed. At its meeting in June of 1937 the use of either an auxiliary tag or label of the Seal on the outside front of all approved appliances was made mandatory effective October 1. Subsequently the effective date of this ruling was postponed until January 1, 1938, subject to further consideration by appropriate committees of the Association. At its last meeting on December 3 the Approval Requirements Committee decided against making the use of auxiliary Approval Seals on appliances mandatory, making it optional with the manufacturers.

It was also decided that gummed labels of the Laboratory Approval Seal should continue to be made available and that a modified form of the tag should be provided. A special subcommittee was appointed to prepare a revised form of the auxiliary tag which will later be made

available to manufacturers of approved appliances who may wish to use this form of the Approval Seal.

Operating Time of Automatic Devices

Both the domestic range subcommittee and the gas water heater subcommittee at their meetings on November 17-18 and November 22-23 respectively revised their approval requirements to reduce the maximum allowable operating time of safety pilots below that now given in the current standards. The domestic range committee reduced the time for the opening cycle from 5 to 3 minutes and the closing cycle from 5 to 2½ minutes for the conventional type of pilot. Those which require a continuously applied force to open them and those which operate each and every time the burner is turned on or off must under the revised requirement operate to turn on the gas supply in 2 minutes and 1½ minutes respectively.

The Subcommittee on Approval Requirements for Gas Water Heaters reduced the time for both the opening and closing cycle for these automatic devices used on water heaters from 10 to 5 minutes in each case. These requirements are, of course, not final and they will be included with other recommended revisions to the current standards later to be published and distributed to the industry for criticism. In the normal course of events any such revisions will probably not become effective until January 1, 1939.

Simplification of Requirements

Steps have been taken to simplify and reduce the number of requirements wherever

possible applying to different types of appliances. In addition to the elimination of certain combustion tests for domestic gas ranges as referred to previously, the gas range subcommittee at its last meeting took action leading to the deletion or simplification of a number of other requirements now specified in the approval standards.

Similar action was also taken on the requirements for central heating gas appliances at the last meeting of the subcommittee in charge of those standards. It is expected that several of the other approval requirements subcommittees will take similar action as soon as possible, which will be reflected in the requirements to become effective January 1, 1939 and thereafter.

House Piping and Appliance Installation

The requirements for house piping and appliance installation which were issued in 1928 and which have become more or less standard for our industry and other interested industries, were reviewed at a meeting of the subcommittee in charge of these requirements on December 1-2. The subcommittee took action to extend the requirements to cover a number of appliances and accessories not generally available at the time the previous requirements were adopted. Also, changes in house piping and appliance installation practice over the period of the past 10 years necessitated certain other revisions. It is expected that recommended revisions will be published and distributed for criticism early in 1938 and that the revised edition of the standards will be made effective January 1, 1939.

Plan Book Shows How To Use A. G. A. Seal

A PLAN Book containing suggestions for advertising the American Gas Association's Laboratory Seal of Approval has been forwarded to all member companies of the Association, accompanied by a letter from President N. C. McGowen recommending that companies advertise the Seal as a valuable guide in the purchase of appliances which comply with national requirements for safety, durability and efficiency.

A wide variety of ideas, layouts and headings that may be used in whole or in part by those who are in charge of the advertising and sales promotion activities of gas companies are described and illustrated in the book, which closes with this message:

"By promoting the accepted standards by which every gas appliance must be judged before receiving the Seal of Approval . . . by hammering the importance and value of this emblem into the consciousness of the gas-appliance-buying public . . . you will automatically increase the prestige of your business and the Gas Industry as a whole. You will automatically increase sales!"

The Association, in its national advertising program, is doing what it now recommends all member companies should do, namely, promote the Seal wherever possible in advertising designed for consumer reading. In the current series of national ads the Seal is illustrated, and the following explanatory text also appears:

"See the beautiful new gas ranges at the showroom of your gas company or ap-

pliance dealer. You'll find them surprisingly low in cost. Look for the Seal of Approval of the Testing Laboratories of the American Gas Association when you buy gas equipment. Appliances bearing this Seal comply with national requirements for safety, durability, and efficiency."

Reproduced here are two mounted electrotypes of the Laboratory Approval Seal which are recommended for use by gas companies in their local advertising. The smaller illustration is $\frac{3}{8}$ in., and the larger one is 1 in. The selling price is \$1.25 each. Address your orders to Association headquarters.



THE GAS INDUSTRY IN 1937

(Continued from page 4)

Range which will be marketed after March 1, 1938. High requirements, including performance and convenience features not previously specified, have been set up for this range and an extensive promotional campaign is now being prepared to advertise it effectively when it appears. A number of manufacturers have indicated that they will have ranges which meet these "super" requirements ready by March 1. In fact, some are already undergoing tests at the A. G. A. Testing Laboratories. A special contest within the gas industry will shortly be held to select an appropriate name for the range.

Laundry Dryer Available

176 Remsen Street
Brooklyn, New York
December 21, 1937

Mr. N. C. McGowen, President
American Gas Association
Houston, Texas

Dear Mr. McGowen:

As Chairman of the Commercial Section, I learn with pleasure that the American Gas Association Laboratories has approved a domestic laundry dryer, after a lapse of about five years in the availability of such an appliance.

We need a domestic laundry dryer to round out the line of gas equipment available to the home and I feel it desirable we give encouragement to manufacturers investing their capital in this rather limited field.

Very truly yours,

Hugh Cutbrell

Chairman, Commercial Section

More Gas Appliances Working in N. Y.

GAS appliance sales by Consolidated Edison Company of New York for the first nine months of 1937 amounted to \$3,494,405, an increase of 36% over the sales for the same period last year. No figures representing gas range sales are included for July, August and September, since the company stopped selling gas ranges on July 1, although continuing to promote their sale through dealers.

"Big Apple" Like a Gas Range

Edwin C. Hill, well known news commentator, said in a recent chapter of his column "Human Side of the News":

"Some dances get hot slowly like electric cook stoves and concert violinists, but the 'Big Apple' is like a gas stove or a temperamental opera singer—it bursts into immediate flame."

HOME SERVICE

(Continued from page 31)

Institute throughout the territory. Trailers used for transporting modern kitchen setups in portable form to be used in auditoriums of schools and club houses through the territory of The Ohio Fuel Gas Company were inspected.

In Pittsburgh a call was made at the

Equitable Gas Company to see the recently modernized Utility Hall, headquarters of the home service department which is under the direction of Mrs. Anne Sutter. A central auditorium in Utility Hall is surrounded by attractive rooms which it is possible to adapt to any customer's home. Each of these rooms show attractive settings for modern gas and electric equipment. A basement and laundry with attractive settings for gas house heating and water heating make that phase of the gas company business attractive to visitors.

A Useful Book

"Modern Kitchens for Homemaking Instructions"—a booklet available from American Gas Association headquarters for 15¢ per copy, or in quantities of twenty-five or over for 10¢ per copy, is a most useful book. To date nearly 3,000 copies have been purchased by gas companies for instructing salesmen and home service directors in the use of gas equipment in school laboratories. Many companies are making this material available to home economics teachers in their territories, and as a result of an announcement in the A. G. A. national advertisements in home economics magazines many requests are coming in from school instructors.

Regional Activities

PACIFIC COAST

Ruth Kruger, Central Arizona Light & Power Co., Phoenix, Arizona, in her activities as chairman of the home service group in the Pacific Coast Gas Association, has announced a plan for a Round Robin News Letter among the fifteen companies maintaining home service departments on the Pacific Coast. The letter operates on a carefully worked out schedule with a plan for the type of material to be included as the letter is passed on by each department, such as plans for winter activities, special courses in training of new members, outside activities, special promotional activities with pictures included where possible, and ways to dramatize lecture demonstrations.

NEW ENGLAND

At the fall meeting of the sales division of the New England Gas Association, 386 people were entertained by a series of sales-slanted demonstrations given by various committee chairmen in the New England home service group. The entire program was under the direction of the chairman, Mrs. Eleanor Kingsley, Worcester Gas Light Company, Framingham. A puppet demonstration entitled "Handy Mc-

Saver's All-Gas Show" by Mrs. Lyda Flanners of the Worcester Gas Light Company opened the meeting. Two modern kitchens installed on the platform provided the setting for the demonstrations, with the performance in one kitchen immediately followed by a performance in the adjoining kitchen.

NEW JERSEY

The home service group in the New Jersey Gas Association, under the chairmanship of Eliza Stephenson, Jersey Central Light & Power Co., Asbury Park, has formed a program with load building, through the use of gas for cooking, refrigeration, house heating, and water heating, as the ultimate objective. The slogan adopted is "Home Service the Sales Laboratory."

Among the activities is a compilation of promotional information on gas ranges sold by ten gas companies. This information is to be condensed and used by home service directors. Skits to feature the other three pieces of equipment are also being developed. Another study is entitled "To Let the Gas Range Cut Your Budget." This project is developed through use of low cost recipes, showing the amount of gas used in each case.

Personnel Service

SERVICES OFFERED

Can I Help You in promotion of appliance sales, load building and public relations? College man, six years' gas utility public contact experience. Meter reader to credit manager, including high bill adjustment. Now employed New York office large industrial. Record proves successful promotional experience. Trained in advertising, merchandising. Qualifications distinctive. 1155.

A Good Salesman—over ten years with national manufacturers distributing gas appliances, air conditioning and pipe fitting specialties. Knows gas officials throughout East and Midwest. Can promote sales by proven methods. Understands advertising helps and is prepared for sales directing work. Wants a good opportunity. 1156.

Appliance Salesman—Twenty years' experience selling gas appliances in all eastern and southern territories. Interested in the exclusive sale of nationally known, or equal products to act as a manufacturer's agent. Have personal contacts with all wholesale and retail dealers and utility companies. Will organize selling force with proper lines. 1159.

Understands selection also methods for improving employee performance and morale; ten years' experience in one of largest combination gas and electric companies, also three years in government personnel work covering three states; familiar with employee training needs and understands how to correct and meet public demand for high quality service. College background. 1160.

Gas Engineer with wide experience, manufacture, house heating, air conditioning, and general appliance sales, also sales promotion experience with large manufacturer. Open for position with gas company's house heating department or as manufacturer's representative; original and practical ideas on range design. Married. 1161.

SERVICES OFFERED

Sales Engineer, gas heating, air conditioning merchandising experience, familiar with retail selling and promotion work through dealers. Previously in supervisory capacity in gas heating department with large heating company. Previously five years selling experience with a large New York metropolitan company. Broad experience, electric and steam power companies. 1162.

Distribution or works superintendent; one who knows how to take the most out of coal carbonized, experienced with horizontal also vertical retorts, wet and dry purification, benzol recovery, the manufacture of sulphate of ammonia; also knows high and low pressure distribution. 1163.

Executive Engineer. Unusual educational background. At present employed. Wide experience and acquaintance in the natural and manufactured gas, electrical and water industries desires change. He had construction, operating, sales, legal, purchasing, accounting and research experience. Widely travelled. Will locate anywhere. Has had success rehabilitating properties producing operating and financial results. 1164.

Gas Engineer with 20 years' experience in the design, construction, operation, and valuation of both manufactured and natural gas properties, desires position where initiative and the ability to handle any problems are necessary. 1165.

Cost accountant—experienced on fixed capital inventory work—familiar with analyzing of records, new unit system set up, cost work and card systems. 1166.

SERVICES OFFERED

Gas Engineer—Househeating and industrial gas sales. Broad experience in gas industry. Expert on winter air conditioning in all phases of work. Outstanding record as a producer of permanent users on all types of gas appliances. Good health, persistent hard worker. Desires connection with utility or manufacturer who can utilize my services on a reasonable basis. At present employed, but desire broader opportunity and better income. Graduate; married (39). 1167.

Manager and Engineer—Over 20 years operating experience on coke oven and water gas plants and with utility management. Experienced in plant and distribution design and construction; with both high and low temperature carbonization processes; gas and equipment sales and survey work and familiar with all domestic, commercial, industrial and house heating equipment. 1170.

Engineer—College graduate with over five years experience utilization department of large gas company and two years engineering department of eastern stove manufacturer. Desires position in engineering department appliance manufacturer. 1171.

POSITIONS OPEN

Distributor's or Manufacturers Agency Representatives for gas automatic water heaters manufactured by nationally known company wanted for territories developed but presently open for new representation. New England with Boston as headquarters; New York State except Greater New York City and Buffalo; Southeast territory with Atlanta, Georgia, as headquarters. 0331.

1938 Advisory Council

H. C. ABELL.....New Orleans, La.
 F. M. BANKS.....Los Angeles, Calif.
 C. E. BENNETT.....Pittsburgh, Pa.
 HOWARD BRUCE.....Baltimore, Md.
 FRANK L. CHASE.....Dallas, Texas
 H. E. CLIFF.....Newark, N. J.
 H. C. COOPER.....Pittsburgh, Pa.
 A. S. CORSON.....Philadelphia, Pa.
 ADDISON B. DAY.....Los Angeles, Calif.
 B. J. DENMAN.....Chicago, Ill.
 O. H. FOGG.....New York, N. Y.
 F. C. FREEMAN.....Providence, R. I.
 JOHN A. FRY.....Detroit, Mich.
 C. W. GALE.....Knoxville, Tenn.
 R. W. GALLAGHER.....New York, N. Y.
 F. L. GRIFFITH.....Chicago, Ill.
 O. S. HAGERMAN.....New York, N. Y.
 C. S. HARRISON.....Toledo, Ohio
 C. W. HUNTER.....Philadelphia, Pa.

SAMUEL INSULL, JR.....Chicago, Ill.
 F. B. JONES.....Pittsburgh, Pa.
 F. A. LEMKE.....Kalamazoo, Mich.
 F. A. LYDECKER.....Newark, N. J.
 R. L. MANIER.....Syracuse, N. Y.
 WM. MOELLER, JR.....Los Angeles, Calif.
 M. I. MIX.....Chicago, Ill.
 B. J. MULLANEY.....Chicago, Ill.
 E. B. NUTT.....New York, N. Y.
 CLIFFORD E. PAIGE.....Brooklyn, N. Y.
 J. F. QUINN.....Brooklyn, N. Y.
 THOS. E. ROACH.....Tacoma, Wash.
 W. FRANK ROBERTS.....Baltimore, Md.
 F. M. ROSENKRANS.....Kansas City, Mo.
 MARCY L. SPERRY.....Washington, D. C.
 J. B. TONKIN.....Pittsburgh, Pa.
 GEORGE E. WELKER.....Oil City, Pa.
 T. R. WEYMOUTH.....New York, N. Y.

AFFILIATED ASSOCIATIONS

Association of Gas Appliance and Equipment Manufacturers

Pres.—Merrill N. Davis, S. R.
 Dresser Mfg. Co., Bradford, Pa.
 Exec. Sec.—C. W. Berghorn, 60
 East 42nd St., New York, N. Y.

Canadian Gas Association

Pres.—E. J. Tucker, Consumers Gas
 Co. of Toronto, Toronto, Ont.
 Sec.-Tr.—G. W. Allen, 7 Astley
 Ave., Toronto.

Empire State Gas and Electric Association

Pres.—J. P. Haftenkamp, Rochester
 Gas & Electric Corp., Rochester,
 N. Y.
 Chairman, Gas Section—F. R. Coster,
 Westchester Lighting Co., Mt.
 Vernon, N. Y.
 Sec.—George H. Smith, Grand Central
 Terminal, New York, N. Y.

Illinois Public Utilities Association

Pres.—E. F. Kelly, Central Illinois
 Public Service Co., Springfield, Ill.
 Sec.—Jack Abbey, 1314 Illinois
 Building, Springfield, Ill.

Indiana Gas Association

Pres.—H. Carl Wolf, Central Indiana
 Gas Co., Muncie, Ind.
 Sec.-Tr.—P. A. McLeod, New Castle,
 Ind.

Michigan Gas Association

Pres.—Howard Pett, Consumers
 Power Co., Lansing, Mich.
 Sec.-Tr.—A. G. Schroeder, Grand
 Rapids Gas Light Co., Grand
 Rapids, Mich.

Maryland Utilities Association

Pres.—D. E. Stultz, Hagerstown,
 Md.
 Sec.—E. J. Roche, 55 Washington
 St., Hagerstown, Md.

Mid-West Gas Association

Pres.—E. J. Boyer, Minneapolis
 Gas Light Co., Minneapolis,
 Minn.
 Sec.-Tr.—Roy B. Searing, Sioux
 City Gas & Electric Co., Sioux
 City, Iowa.

Missouri Association of Public Utilities

Pres.—Chester C. Smith, Kansas
 City Power and Light Co., Kansas
 City, Mo.
 Sec.-Tr.—N. R. Beagle, Missouri
 Power & Light Co., Jefferson
 City, Mo.
 Asst. Sec.—Jesse Blythe, 103 West
 High St., Jefferson City, Mo.

New England Gas Association

Pres.—F. L. Fletcher, Providence
 Gas Co., Providence, R. I.
 Exec. Sec.—Clark Belden, 41 Mt.
 Vernon St., Boston, Mass.

New Jersey Gas Association

Pres.—J. P. Leinroth, Public Service
 Electric and Gas Co., Newark,
 N. J.
 Sec.-Tr.—H. A. Sutton, Public
 Service Electric and Gas Co.,
 Newark, N. J.

Ohio Gas and Oil Men's Association

Pres.—Warren E. Burns, Marietta,
 Ohio.
 Sec.-Tr.—Frank B. Maullar, 811
 First National Bank Bldg., Columbus,
 Ohio.

Oklahoma Utilities Association

Pres.—J. P. Arnold, Public Service
 Co. of Oklahoma, Tulsa, Okla.
 Acting Sec.—Kate A. Niblack, 625
 Biltmore Hotel, Oklahoma City,
 Okla.

Pacific Coast Gas Association

Pres.—Norman R. McKee, Southern
 Counties Gas Co., Los Angeles,
 Calif.
 Mang. Dir.—Clifford Johnstone,
 447 Sutter St., San Francisco,
 Calif.

Pennsylvania Gas Association

Pres.—H. S. Christman, The Philadelphia
 Gas Works Co., Philadelphia,
 Pa.
 Sec.—Frank W. Lesley, Pennsylvania
 Gas & Electric Co., York,
 Pa.

Pennsylvania Natural Gas Men's Association

Pres.—Frank M. Brewster, Belmont
 Quadrangle Drilling Corp., Bradford,
 Pa.
 Sec.-Tr.—B. H. Smyers, Jr., 435
 Sixth Ave., Pittsburgh, Pa.

Southern Gas Association

Pres.—Chester May, Community
 Natural Gas Co., Dallas, Texas.
 Sec.-Tr.—S. L. Drumm, New Orleans
 Public Service Inc., New Orleans,
 La.

Wisconsin Utilities Association

Pres.—C. E. Kohlhepp, Wisconsin
 Public Service Corp., Green Bay,
 Wis.
 Exec. Sec.—A. F. Herwig, 135 West
 Wells St., Milwaukee, Wis.

AMERICAN GAS ASSOCIATION

HEADQUARTERS, 420 LEXINGTON AVE., NEW YORK, N. Y.

OFFICERS AND DIRECTORS

President	N. C. MCGOWEN.....	Shreveport, La.
Vice-President	CONRAD N. LAUER.....	Philadelphia, Pa.
Vice-President	WALTER C. BECKJORD.....	New York, N. Y.
Treasurer	J. F. ROONEY.....	New York, N. Y.
Managing Director	ALEXANDER FORWARD.....	New York, N. Y.
Assistant Manager	H. W. HARTMAN.....	New York, N. Y.
Secretary	KURWIN R. BOYES.....	New York, N. Y.
Director, Publicity-Advg.	C. W. PERSON.....	New York, N. Y.
Director, Home Appliance Planning Bureau	J. F. QUINLAN.....	New York, N. Y.
Departmental Vice-Pres.	ROBERT W. HENDEE.....	Colorado Spgs., Colo.
Sectional Vice-Pres.	D. H. MITCHELL.....	Hammond, Ind.
Sectional Vice-Pres.	HUGH CUTHRELL.....	Brooklyn, N. Y.
Sectional Vice-Pres.	HALE A. CLARK.....	Detroit, Mich.
Sectional Vice-Pres.	MERRILL N. DAVIS.....	Bradford, Pa.
Sectional Vice-Pres.	J. V. POSTLES.....	Philadelphia, Pa.
Chairman, Pub. & Advg.	HENRY OBERMEYER.....	New York, N. Y.
FRANK H. ADAMS.....	Toledo, Ohio	
C. W. BENNETT.....	Detroit, Mich.	
C. M. COHN.....	Baltimore, Md.	
J. S. DeHART.....	Newark, N. J.	
H. L. DOHERTY.....	New York, N. Y.	
L. B. DENNING.....	Dallas, Texas	
C. E. GALLAGHER.....	Cleveland, Ohio	
GEORGE S. HAWLEY.....	Bridgeport, Conn.	
GEORGE F. MITCHELL.....	Chicago, Ill.	
P. S. YOUNG.....	Newark, N. J.	
F. A. NEWTON.....	New York, N. Y.	
JAMES F. POLLARD.....	Seattle, Wash.	
W. T. RASCH.....	New York, N. Y.	
HERMAN RUSSELL.....	Rochester, N. Y.	
N. T. SELLMAN.....	New York, N. Y.	
OTTO SNYDER.....	Albany, N. Y.	
W. E. STEINWEDELL.....	Cleveland, Ohio	
T. J. STRICKLER.....	Kansas City, Mo.	
JOHN K. SWANSON.....	Minneapolis, Minn.	

SECTION AND DEPARTMENT OFFICERS

NATURAL GAS—Chairman	ROBERT W. HENDEE.....	Colorado Spgs., Colo.
Vice-Chairman	THOMAS R. WEYMOUTH.....	New York, N. Y.
Secretary	E. H. POE.....	Dallas, Texas
ACCOUNTING—Chairman	D. H. MITCHELL.....	Hammond, Ind.
Vice-Chairman	H. A. EHREMAN.....	New York, N. Y.
Secretary	H. W. HARTMAN.....	New York, N. Y.
COMMERCIAL—Chairman	HUGH CUTHRELL.....	Brooklyn, N. Y.
Vice-Chairman	F. X. METTENET.....	Chicago, Ill.
Secretary	J. W. WEST, Jr.....	New York, N. Y.
INDUSTRIAL GAS—Chairman	HALE A. CLARK.....	Detroit, Mich.
Vice-Chairman	FRANK H. TREMBLY, Jr.....	Philadelphia, Pa.
Secretary	EUGENE D. MILENER.....	New York, N. Y.
MANUFACTURERS—Chairman	MERRILL N. DAVIS.....	Bradford, Pa.
TECHNICAL—Chairman	J. V. POSTLES.....	Philadelphia, Pa.
Vice-Chairman	F. M. GOODWIN.....	Boston, Mass.
Secretary	H. W. HARTMAN.....	New York, N. Y.
PUBLICITY & ADVERTISING COMMITTEE—Chairman	HENRY OBERMEYER.....	New York, N. Y.
A. G. A. TESTING LABORATORIES— Chairman, Managing Committee	J. S. DeHART, Jr.....	Newark, N. J.
Secretary, Managing Committee	N. T. SELLMAN.....	New York, N. Y.
Director	R. M. CONNER.....	Cleveland, Ohio

